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1. SPECIFICATIONS

SPECIFICATIONS

Name & Model			BA10AB.AC
Overall length (mm)			1850
Overall width (mm)			685
Overall height (mm)			1075
Wheel base (mm)			1270
Engine type			Air cooled 2-stroke
Displacement (cc)			49.5 cc
Net weight (kg)	Front wheel		37
	Rear wheel		58.5
	Total		95.5
Seating capacity			2 riders (110kg)
Gross weight(kg)	Front wheel		79
	Rear wheel		126.5
	Total		205.5
Tires	Front wheel		70/90-16 42J
	Rear wheel		90/90-16 54J
Ground clearance (mm)			175
Braking distance (m) (Initial speed Km/h)			4.4m (30km/h)
Min. turning radius (mm)			1900
Starting system			Starting motor & kick starter
Fuel type			Gasoline, 2-stroke motor oil
Cylinder arrangement			Single cylinder, flat
Combustion chamber type			Semi-sphere
Valve arrangement			Reed valve & piston
Bore x stroke (mm)			39 x 41.4
Compression ratio			10.3:1 ±0.2
Compression pressure (kg/cm≤ rpm)			11.8kg/cm≤ ±2
Max. output (kw/r/min)			1.765/5400 kw/r/min
Max. torque (kg m/rpm)			0.33/4600 kg m/rpm
Port timing	Intake	Open	Automatic controlled
		Close	Automatic controlled
	Exhaust	Open	—
		Close	—
	Scavenge	Open	—
		Close	—
Idle speed (rpm)			2000±100
Lubrication type			Separate type
Oil pump type			Plunger type
Oil filter type			Full-flow filtration

Lubrication oil capacity (liter)			1.1
Air cleaner type & No.			Wet, single
Fuel capacity (liter)			5.8
Carburetor	Type		Plunger type
	Piston dia. (mm)		—
	Venturi dia. (mm)		16
Ignition system type			CDI electromagnetic Ignition
Ignition timing F mark			8 ~14 ±1.5 BTDC/2000 rpm
Spark plug		NGK	BR8HSA
		ND	
Spark plug gap (mm)			0.6_ 0.7
Battery capacity			12V4AH
Power to transmission gear			Power-transmission gear-clutch
Reduction ratio of power to transmission			—
Clutch type			Dry multi-disc clutch
Transmission gear operation type			Automatic centrifugal type
Transmission ratio	1 speed		—
Reduction gear	Type		Two-stage reduction
	1st reduction ratio		3.113~0.895
	2nd reduction ratio		14.69
Transmission gear type			Non-stage transmission
Tire pressure (kg/cm≤)	Front		1.75 kg/cm≤
	Rear wheel		2.0 kg/cm≤
Turning angle			Right & left 45
Brake system type	Front		Expanding/hydraulic
	Rear wheel		Expanding
Suspension type	Front		Telescope
	Rear wheel		Unit swing
Shock absorber type	Front		Telescope
	Rear wheel		Unit swing
Frame type			Pipe under bone

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GENERAL INFORMATION

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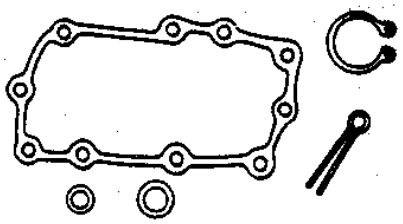
ENGINE SERIAL NUMBER/IDENTIFICATION

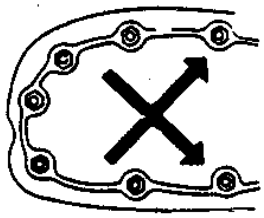
Location of Engine Serial Number

SERVICE PRECAUTIONS

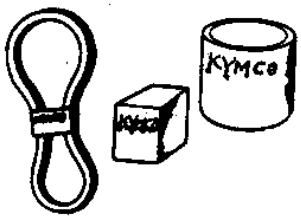
■ Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling



■ When tightening bolts or nuts, begin with larger-diameter to smaller ones at several times, and tighten to the specified torque diagonally.

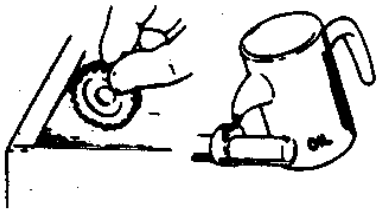


■ Use genuine parts and lubricants.

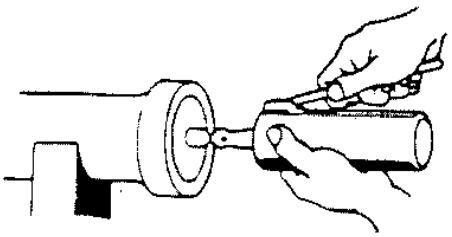


■ When servicing the motorcycle, be sure to use special tools for removal and installation.

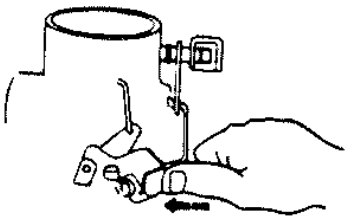
■ After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.



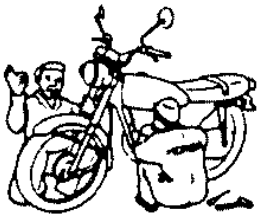
■ Apply or add designated greases and lubricants to the specified lubrication points.



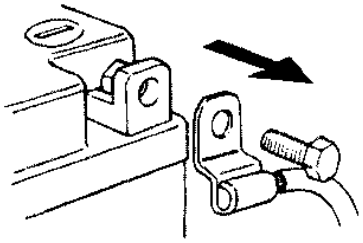
■ After reassembly, check all parts for proper tightening and operation.



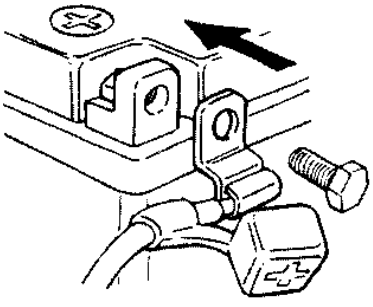
■ When two persons work together, pay attention to the mutual working safety.



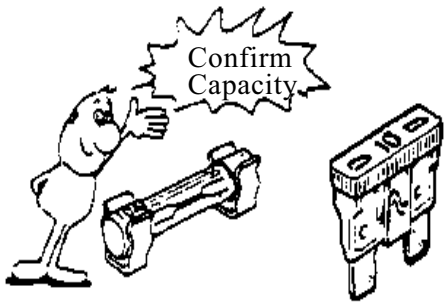
■ Disconnect the battery negative (-) terminal before operation.
■ When using a spanner or other tools, make sure not to damage the motorcycle surface.



■ After operation, check all connecting points, fasteners, and lines for proper connection and installation.
■ When connecting the battery, the positive (+) terminal must be connected first.
■ After connection, apply grease to the battery terminals.
■ Terminal caps shall be installed securely.

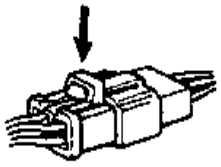


■ If the fuse is burned out, find the cause and repair it. Replace it with a new one according to the specified capacity.

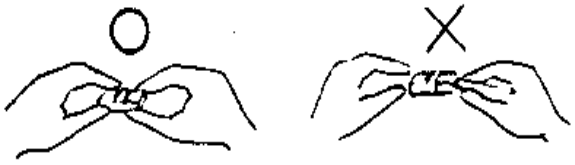


■ After operation, terminal caps shall be installed securely.

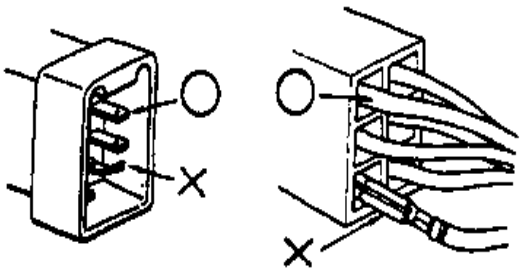
■ When taking out the connector, the lock on the connector shall be released before operation.



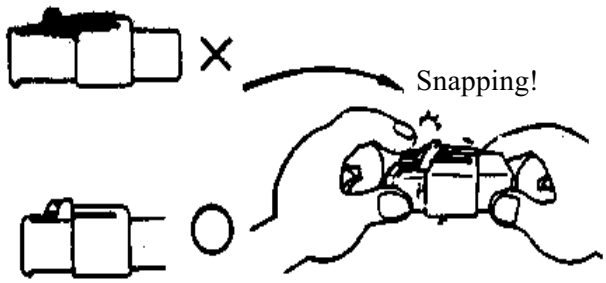
■ Hold the connector body when connecting or disconnecting it.
■ Do not pull the connector wire.



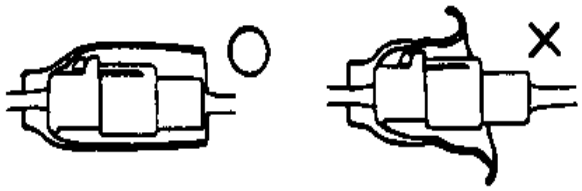
■ Check if any connector terminal is bending, protruding or loose.



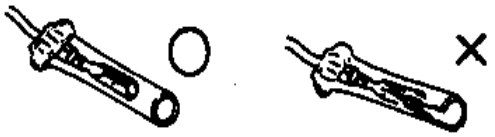
- The connector shall be inserted completely.
- If the double connector has a lock, lock it at the correct position.
- Check if there is any loose wire.



- Before connecting a terminal, check for damaged terminal cover or loose negative terminal.

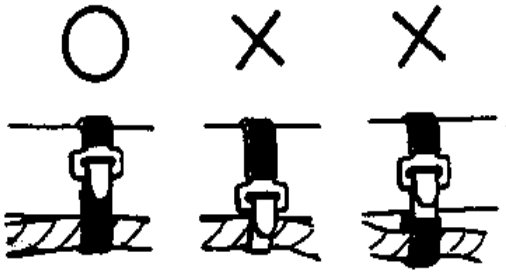


- Check the double connector cover for proper coverage and installation.

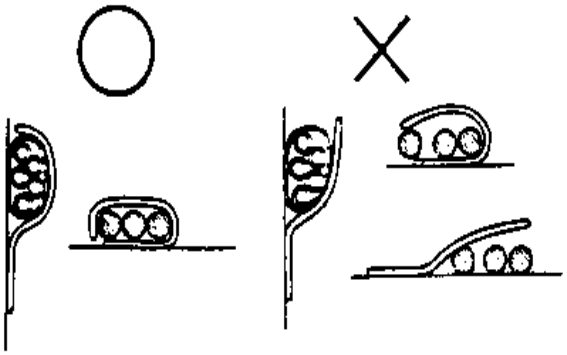


- Insert the terminal completely.
- Check the terminal cover for proper coverage.
- Do not make the terminal cover opening face up.

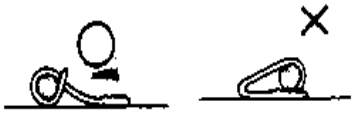
- Secure wire harnesses to the frame with their respective wire bands at the designated locations.
  Tighten the bands so that only the insulated surfaces contact the wire harnesses.



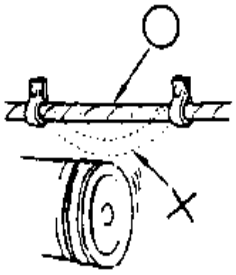
■ After clamping, check each wire to make sure it is secure.



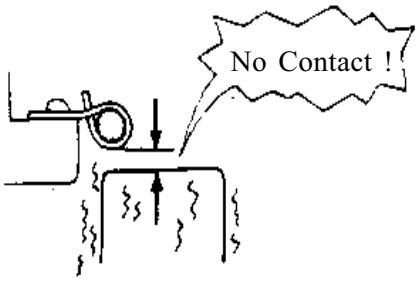
■ Do not squeeze wires against the weld or its clamp.



■ After clamping, check each harness to make sure that it is not interfering with any moving or sliding parts.

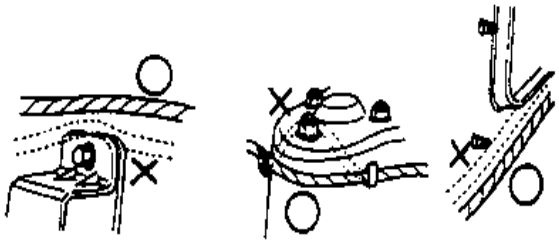


■ When fixing the wire harnesses, do not make it contact the parts which will generate high heat.

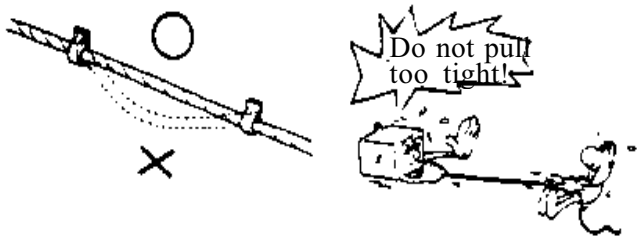


■ Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws.

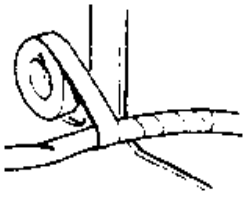
■ Route wire harnesses passing through the side of bolts and screws. Avoid the projected ends of bolts and screws.



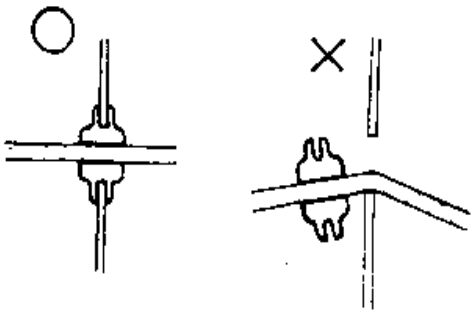
■ Route harnesses so they are neither pulled tight nor have excessive slack.



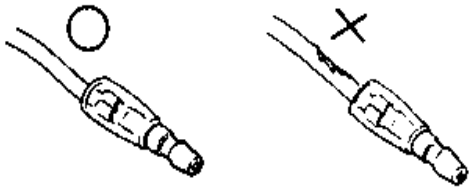
■ Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.



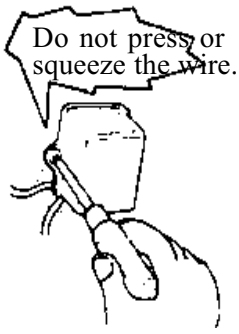
■ When rubber protecting cover is used to protect the wire harnesses, it shall be installed securely.



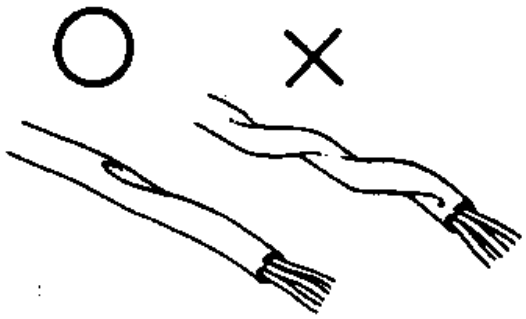
■ Do not break the sheath of wire.
■ If a wire or harness is with a broken sheath, repair by wrapping it with protective tape or replace it.



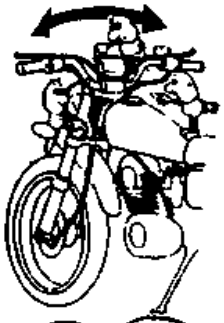
■ When installing other parts, do not press or squeeze the wires.



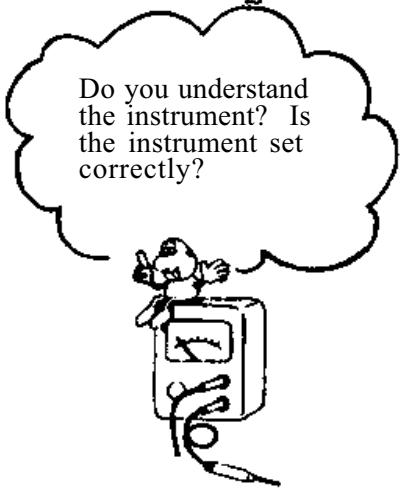
■ After routing, check that the wire harnesses are not twisted or kinked.



■ Wire harnesses routed along with handlebar should not be pulled tight, have excessive slack or interfere with adjacent or surrounding parts in all steering positions.



■ When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.



■ Be careful not to drop any parts.

■ When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.

■ Symbols:

The following symbols represent the servicing methods and cautions included in this service manual.

Engine Oil

: Apply engine oil to the specified points. (Use designated engine oil for lubrication.)

Grease

: Apply grease for lubrication.

Special

: Use special tool.

❊ : Caution

: Warning

SERVICE INFORMATION

ENGINE	Standard (mm)	Service Limit (mm)
Item	BA10AB.AC.	BA10AB.AC.
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston	38.970_ 38.955	38.90
Cylinder-to- piston clearance		0.10
Piston pin hole I.D.	12.002_ 12.008	12.03
Piston pin O.D.	11.994_ 12.0	11.98
Piston-to-piston pin clearance	←	←
Piston ring end gap (top/second)	0.10_ 0.25	0.40
Connecting rod small end I.D.	17.005_ 17.017	17.03
Cylinder bore	39.0_ 39.025	39.05
Drive belt width	18	17
Drive pulley collar O.D.	20.01_ 20.025	←
Movable drive face ID.	20.035_ 20.085	19.97
Weight roller O.D.	13.0	12.4
Clutch outer I.D.	107_ 107.2	107.5
Driven face spring free length	87.9	82.6
Driven face O.D.	←	←
Movable driven face I.D.	←	←
Connecting rod big end side clearance	←	←
Connecting rod big end radial clearance	←	←
Crankshaft runout A/B	—	←

CARBURETOR	BA10AB.AC
Venturi dia.	14mm
Identification number	PB058A
Float level	8.6mm
Main jet	#85
Slow jet	#35
Air screw opening	1_ ± _
Idle speed	2000±100rpm
Throttle grip free play	2_ 6mm
Jet needle clip notch	1st notch

FRAME		Standard (mm)	Service Limit (mm)
Item		BA10AB.AC.	BA10AB.AC.
Axle shaft runout		—	0.2
Front wheel rim runout	Radial		
	Axial		
Front shock absorber spring free length		200.0	182.8
Rear wheel rim runout			2.0
Brake drum I.D.	Front/rear	110	111
Brake lining thickness	Front/rear	4.0/4.0	2.0/2.0
Brake disk runout	Front/rear	—	0.30
Rear shock absorber spring free length		235.7	218.7

ELECTRICAL EQUIPMENT			BA10AB.AC
Battery	Capacity		12V4AH
	Voltage		13.0_ 13.2V
	Charging current	Standard	0.4A/5H
		Quick	4A/0.5H
Spark plug	(NGK)		BR8HSA
Spark plug gap			0.6_ 0.7mm
Ignition coil resistance	Primary coil		0.153_ 0.187Ω
	Secondary coil (with plug cap)		6.99_ 10.21KΩ
	Secondary coil (without plug cap)		3.24_ 3.96KΩ
Pulser coil resistance (20℃)			80_ 160Ω
Ignition timing			8 ~14 ±1.5 BTDC/2000rpm

TORQUE VALUES

ENGINE

Item	Thread dia. (mm)	Torque (kg-m)	Remarks
Cylinder head bolt	BF7x115	1.5_ 1.7	(cold)
Clutch drive plate nut	10	3.5_ 4.0	
Clutch outer nut	NH10	3.5_ 4.5	
Drive face nut	NH12	5.0_ 6.0	
Oil check bolt	10	1.0_ 1.5	
Engine mounting bolt	BF10x95	4.5_ 5.5	
Engine hanger bracket bolt	BF10x50	3.5_ 4.5	
Exhaust muffler joint lock nut	NC6mm	1.0_ 1.4	
Exhaust muffler lock bolt	BF8x35	3.0_ 3.6	
Spark plug		1.1_ 1.7	(cold)

FRAME

Item	Thread dia. (mm)	Torque (kg-m)	Remarks
Handlebar lock nut	10	4.5_ 5.0	Flange bolt/U-nut
Steering stem lock nut	25.4	8.0_ 12.0	
Steering top cone race	25.4	0.5_ 1.3	
Front axle nut	12	5.0_ 7.0	Flange U-nut
Rear axle nut	16	11.0_ 13.0	Flange U-nut
Rear brake arm bolt			Flange nut
Front shock absorber:			
upper mount bolt	8	3.3	Flange bolt/U-nut
lower mount bolt		3.3	Cross head
hex bolt		1.5_ 3.0	Apply locking agent
Front damper nut	8	1.5_ 3.0	
Front pivot arm bolt			Flange screw/U-nut
Rear shock absorber:			
upper mount bolt	10	3.5_ 4.5	Flange nut
lower mount bolt	8	2.4_ 3.0	
lower joint nut	8	1.5_ 2.5	

Torque specifications listed above are for important fasteners. Others should be tightened to standard torque values below.

STANDARD TORQUE VALUES SH bolt: 8mm Flange 6mm bolt

Item	Torque (kg-m)	Item	Torque (kg-m)
5mm bolt, nut	0.45_ 0.6	5mm screw	0.35_ 0.5
6mm bolt, nut	0.8_ 1.2	6mm screw, SH bolt	0.7_ 1.1
8mm bolt, nut	1.8_ 2.5	6mm flange bolt, nut	1.0_ 1.4
10mm bolt, nut	3.0_ 4.0	8mm flange bolt, nut	2.4_ 3.0
12mm bolt, nut	5.0_ 6.0	10mm flange bolt, nut	3.5_ 4.5

SPECIAL TOOLS

Tool Name	Tool No.	Remarks
Universal bearing puller		Crankshaft bearing removal
Lock nut wrench, 39mm		Drive pulley disassembly/assembly
Lock nut socket wrench		Top cone race holding
Lock nut wrench,		Stem lock nut tightening
Crankcase puller		Crankcase disassembly
Bearing remover set, 12mm (Spindle assy, 15mm) (Remover weight)		Drive shaft bearing removal/installation
Bearing remover set, 15mm (Spindle assy, 15mm) (Remover head, 15mm) (Remover shaft, 15mm)		Drive shaft bearing removal/installation
Bearing outer driver, 28x30mm		Bearing installation
Bearing remover		Driven pulley outer bearing installation
Clutch spring compressor		Driven pulley disassembly/assembly
Crankcase assembly collar		Driven shaft, crankshaft & crankcase assembly
Crankcase assembly tool		Crankshaft & crankcase assembly
Rear shock absorber remover		Front shock absorber disassembly/ assembly
Ball race remover		Steering stem bearing races
Rear shock absorber compressor		Rear shock absorber disassembly/assembly
Float level gauge		Carburetor fuel level check
Lock nut socket wrench, 32mm		One-way clutch lock nut removal/ installation
Universal holder		Flywheel holding
Flywheel puller		Flywheel removal
Pilot, 12mm		Drive shaft bearing installation
Bearing outer driver, 32x35mm		Drive shaft bearing installation Final shaft bearing installation

Tool Name	Tool No.	Remarks
Bearing outer driver, 37x40mm		Drive shaft bearing installation Final shaft bearing installation Crankshaft bearing installation
Outer driver, 24x26mm		Driven pulley bearing installation
Pilot, 10mm		Front wheel bearing installation
Bearing driver pilot, 17mm		Drive shaft bearing installation
Snap ring pliers (close)		Circlip removal/installation
Bearing outer driver, 42x47mm		Crankshaft bearing installation
Pilot, 20mm		Crankshaft bearing installation
Bearing outer driver handle A		Bearing installation Drive in ball race
Bearing puller head, 10mm		Front wheel bearing removal
Universal bearing puller		Crankshaft bearing removal
Bearing puller		Front wheel bearing removal
Pressure tester set		Cylinder compression gauge

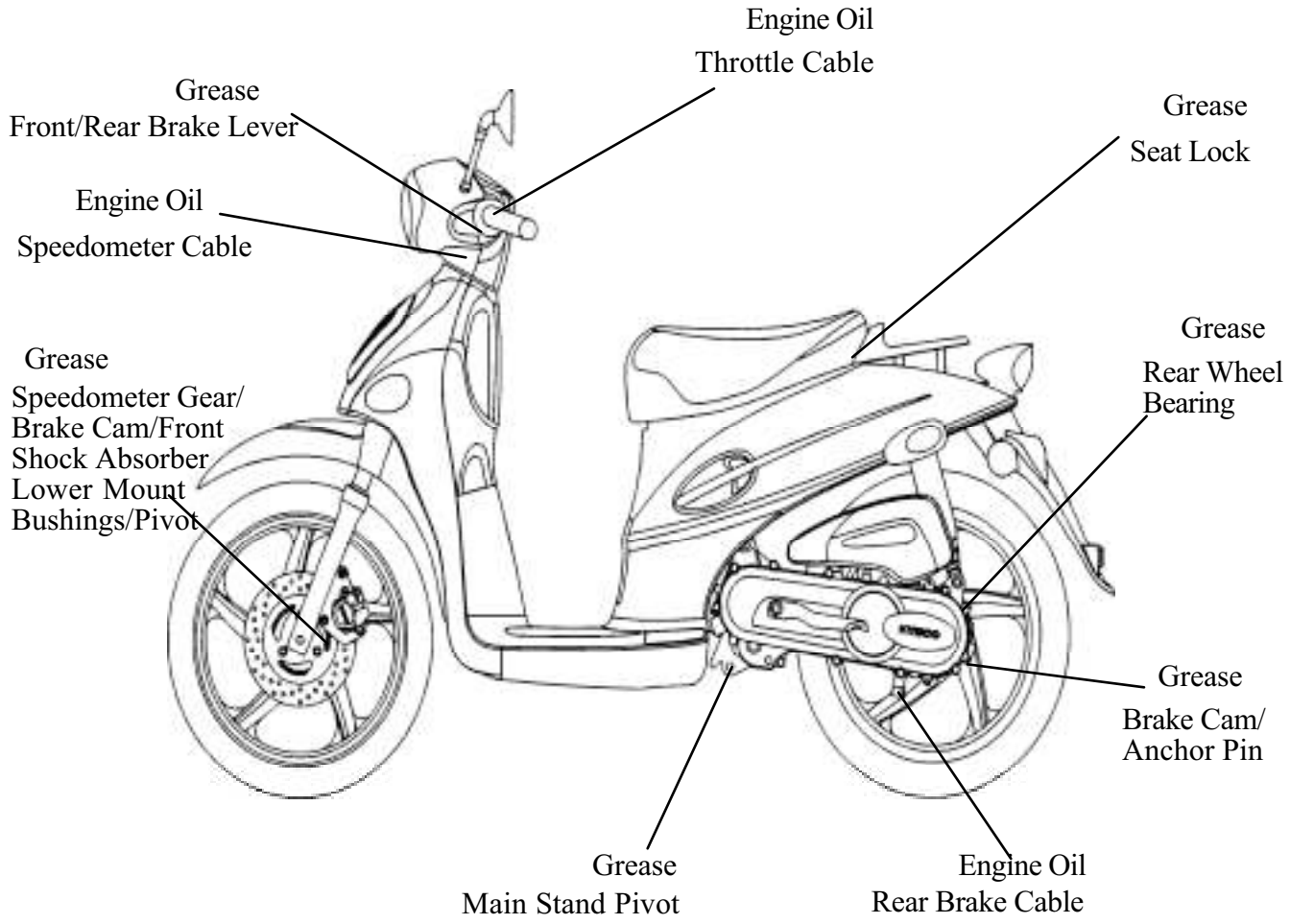
LUBRICATION POINTS

ENGINE

NO.	Lubrication Points	Lubricant	Remarks
1	Crankcase sliding & movable parts	JASO-FC or API-TC	
2	Cylinder movable parts		
3	Transmission gear (final gear)	SAE-90#	
4	Kick starter spindle bushing	Grease	
5	Drive pulley movable parts	Grease	
6	Starter pinion movable parts	Grease	

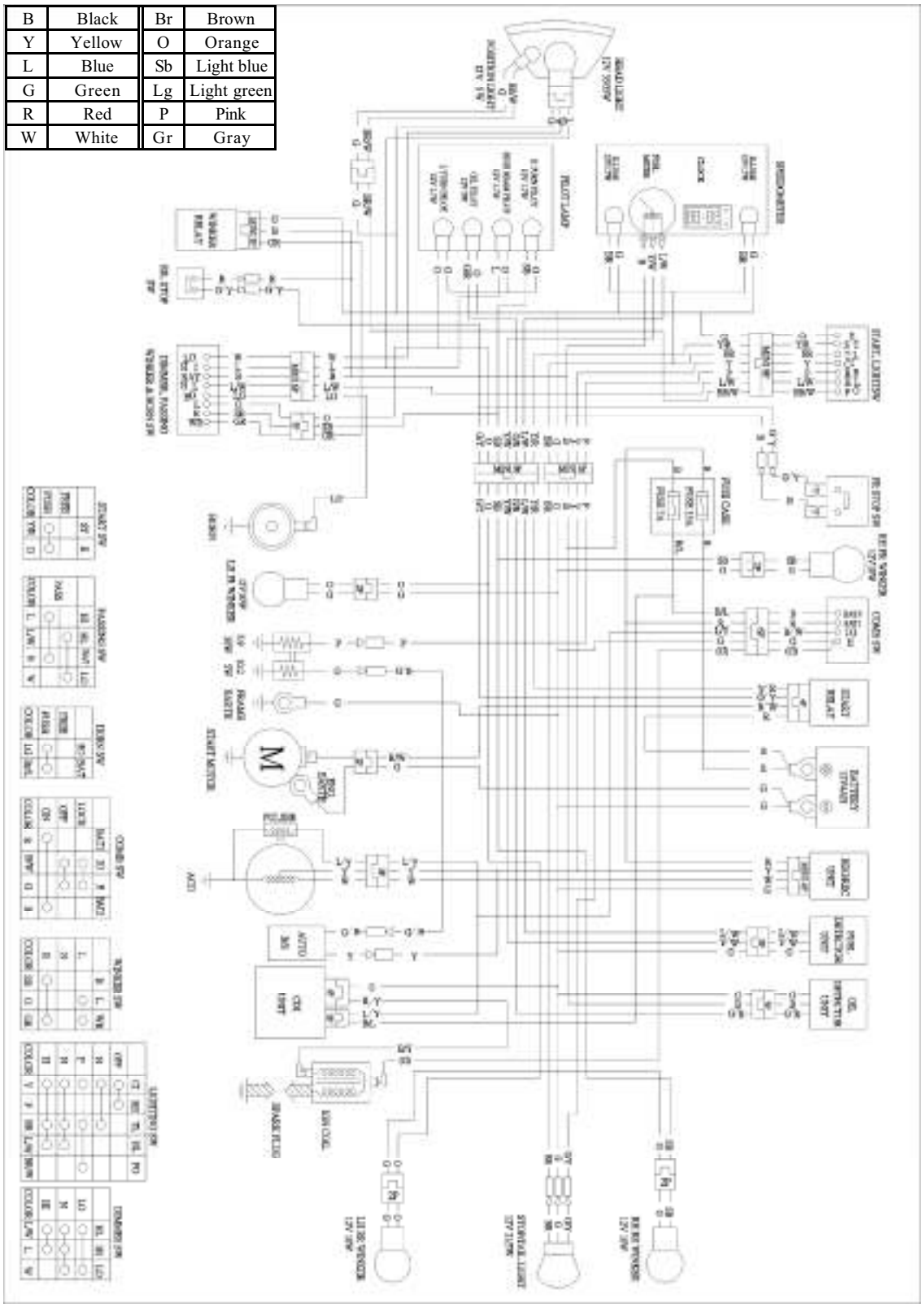
FRAME

Apply clean engine oil or grease to cables and movable parts not specified. This will avoid abnormal noise and rise the durability of the motorcycle.

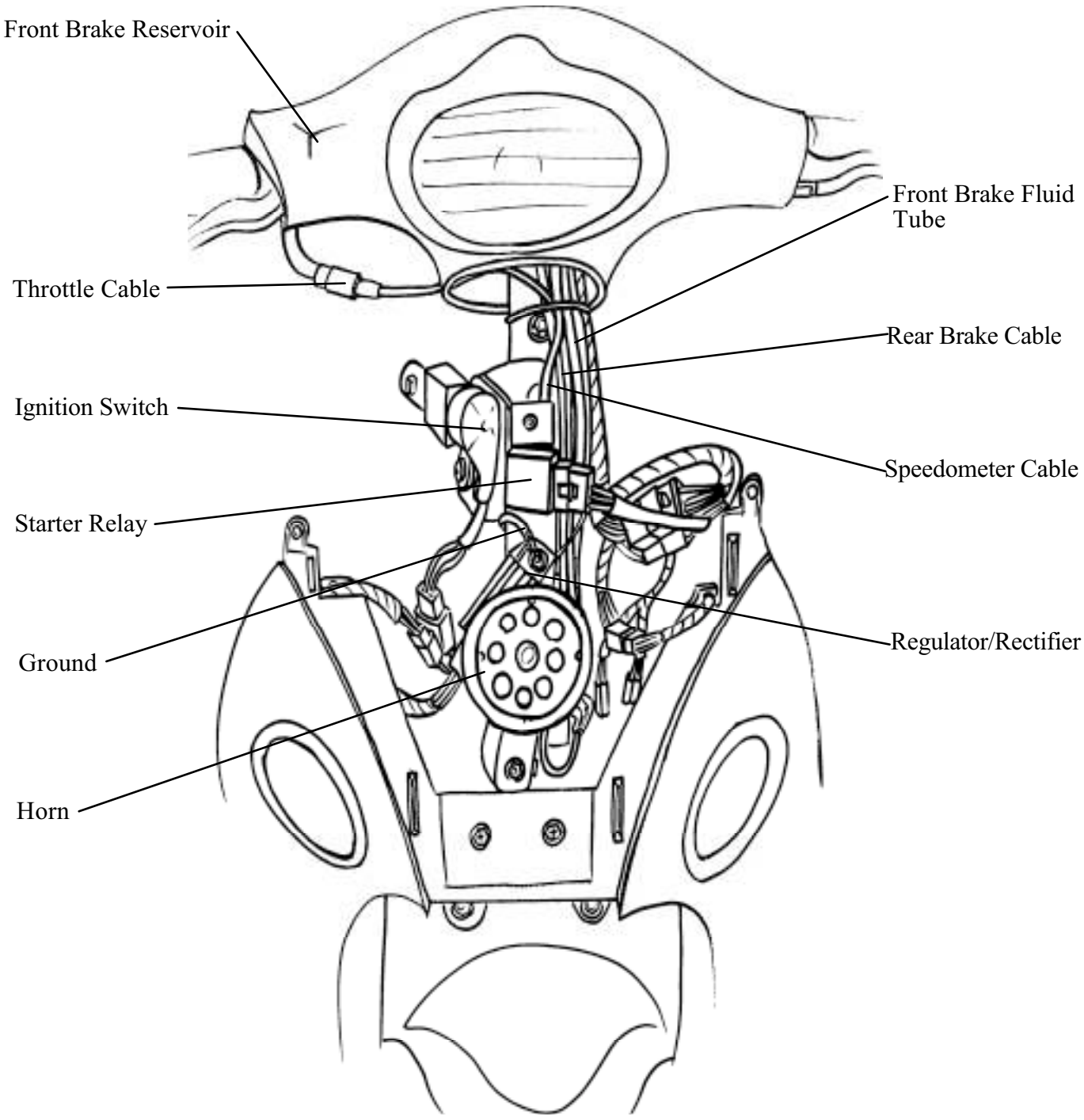


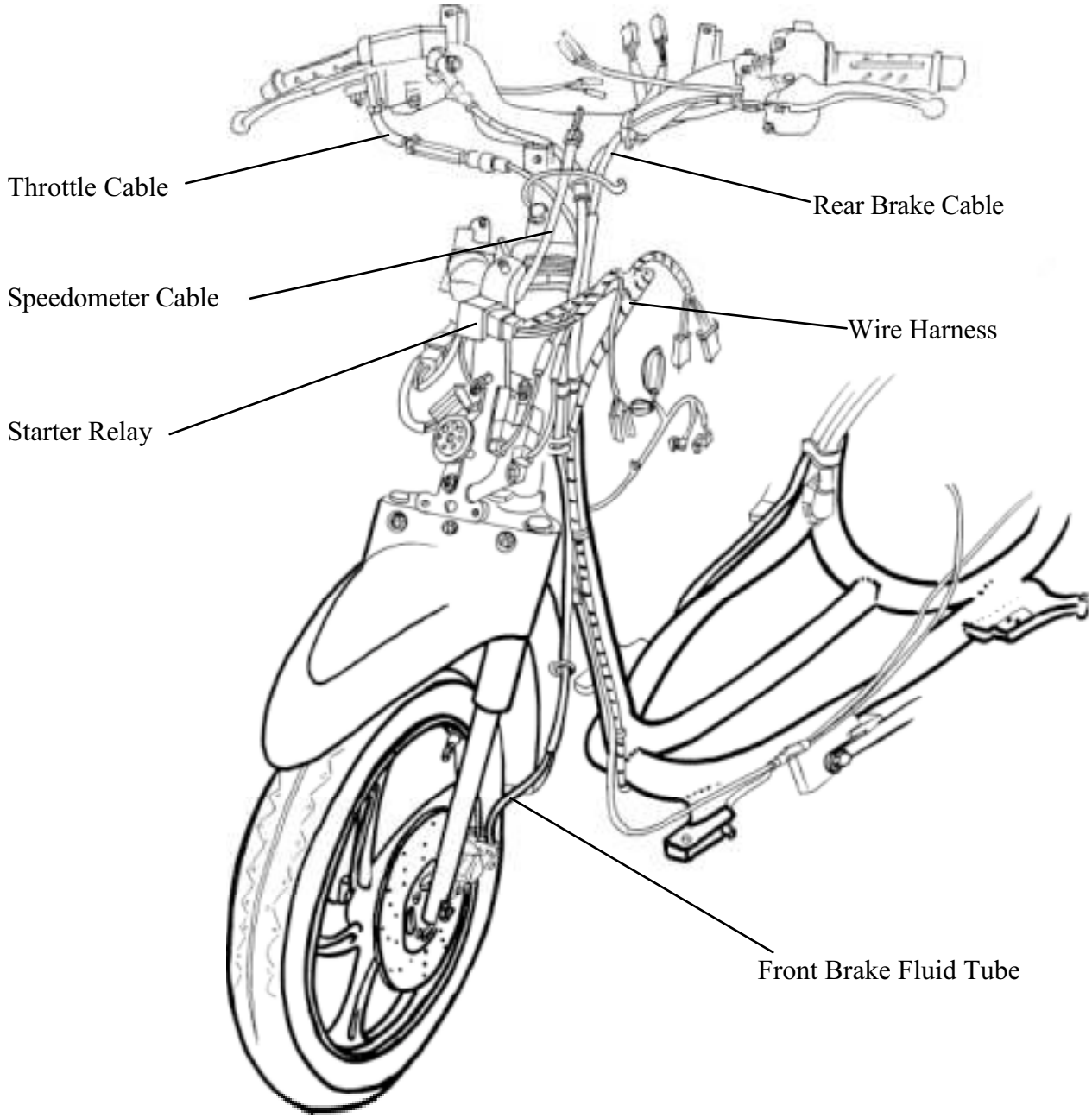
BA10AB.AC. WIRING DIAGRAM

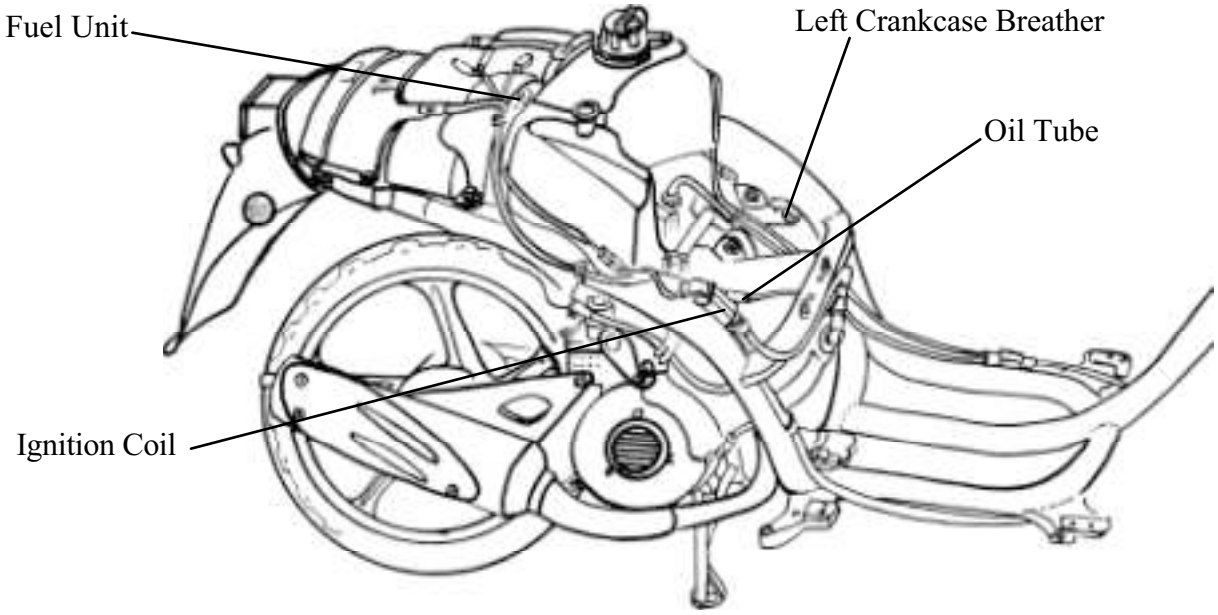
B	Black	Br	Brown
Y	Yellow	O	Orange
L	Blue	Sb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

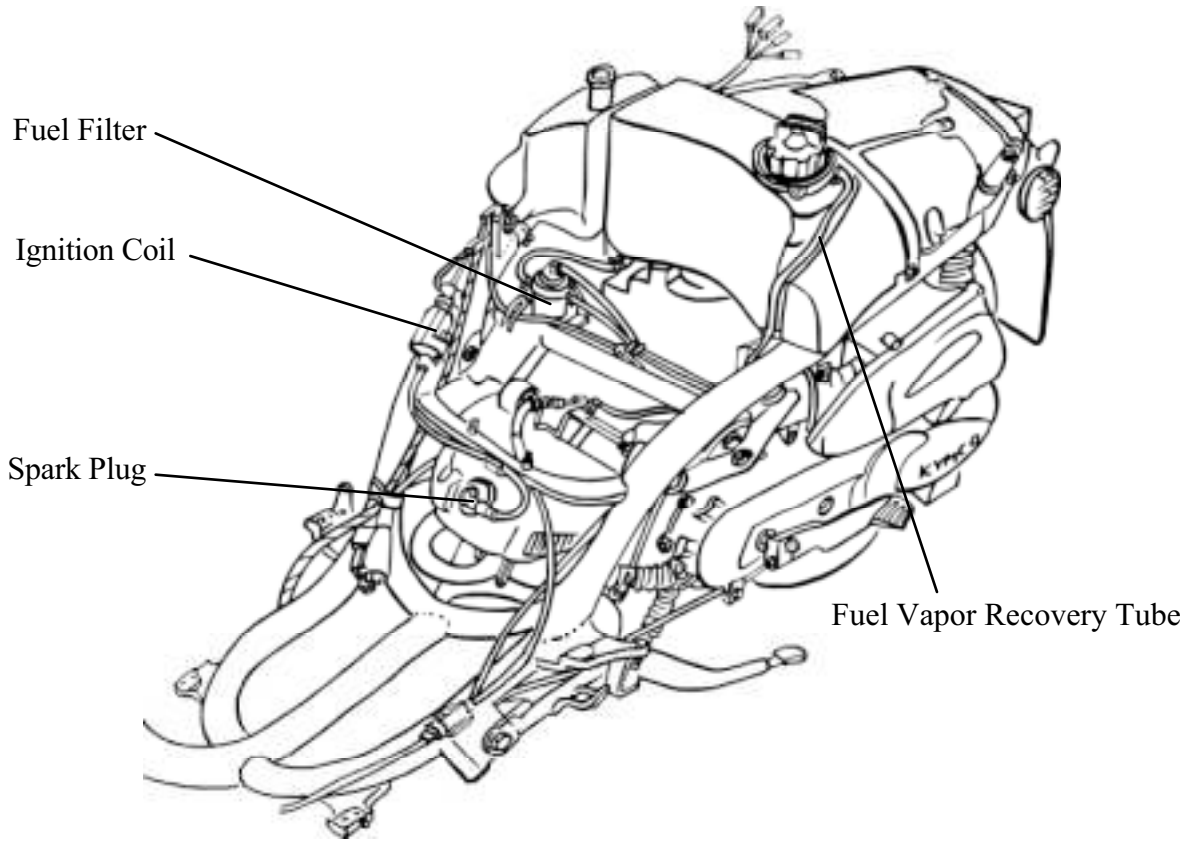


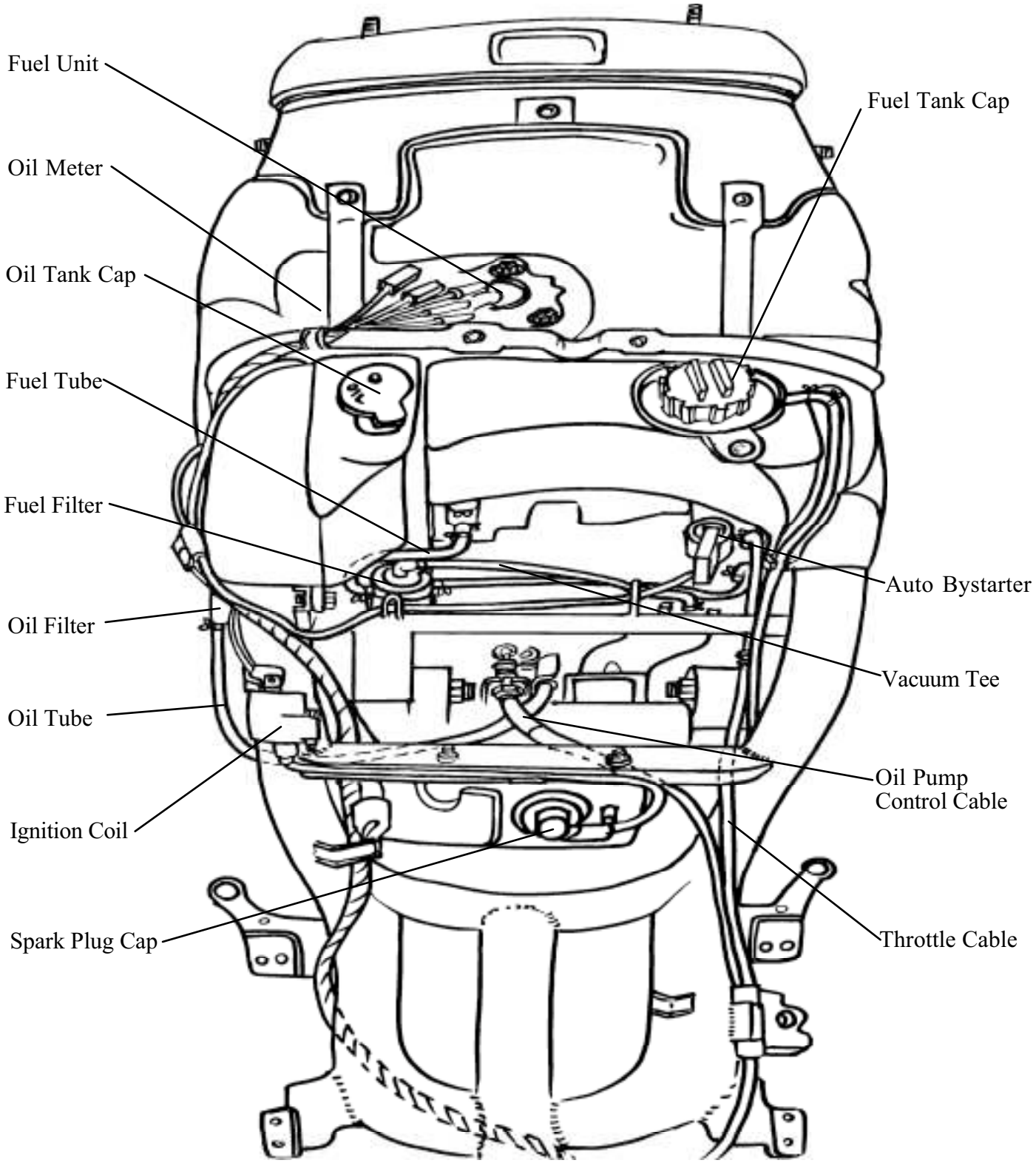
CABLE & HARNESS ROUTING




Throttle Cable
Rear Brake Cable
Speedometer Cable
Wire Harness
Starter Relay
Front Brake Fluid Tube

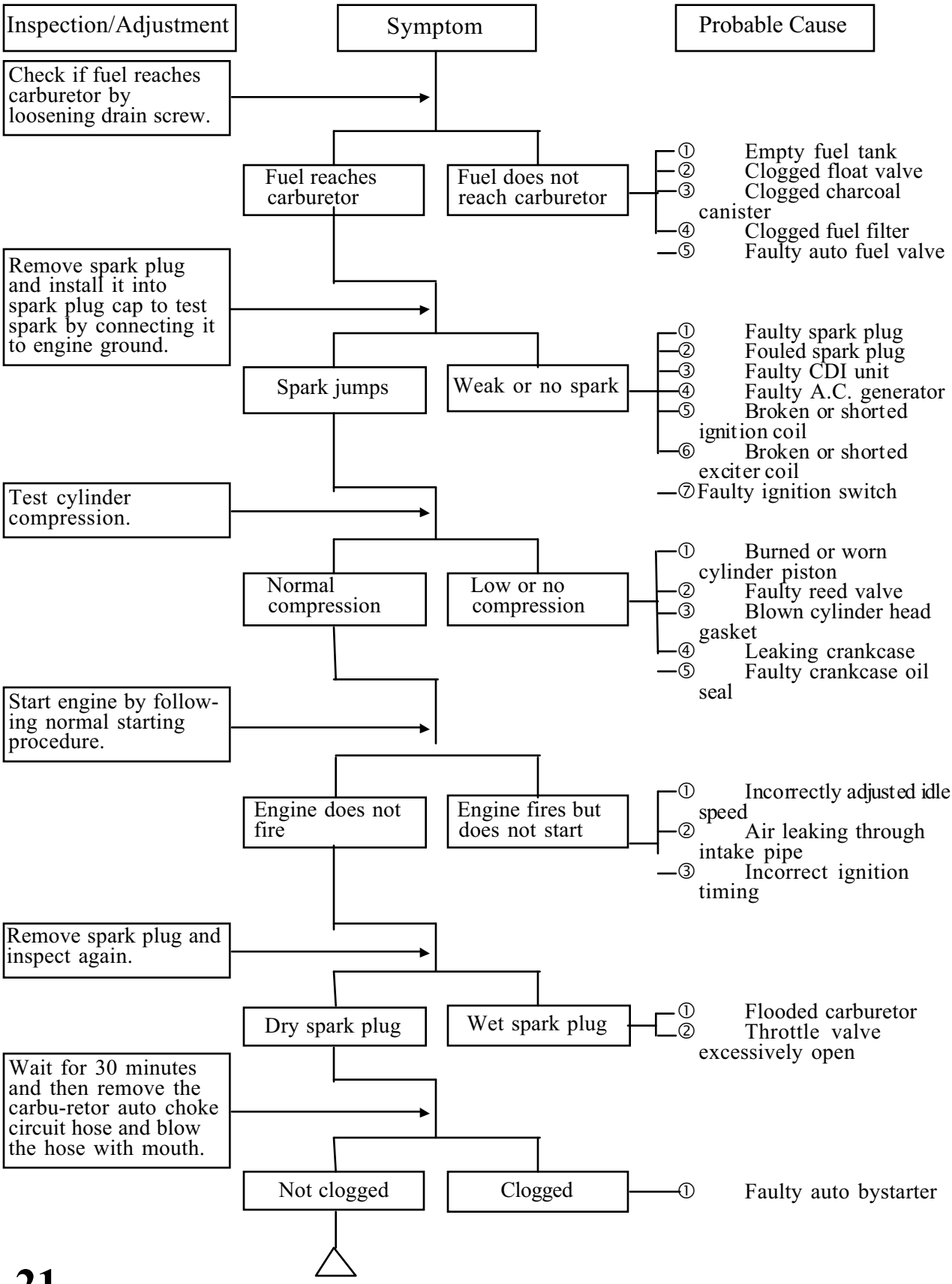

Fuel Unit
Left Crankcase Breather
Oil Tube
Ignition Coil


Fuel Filter
Ignition Coil
Spark Plug
Fuel Vapor Recovery Tube

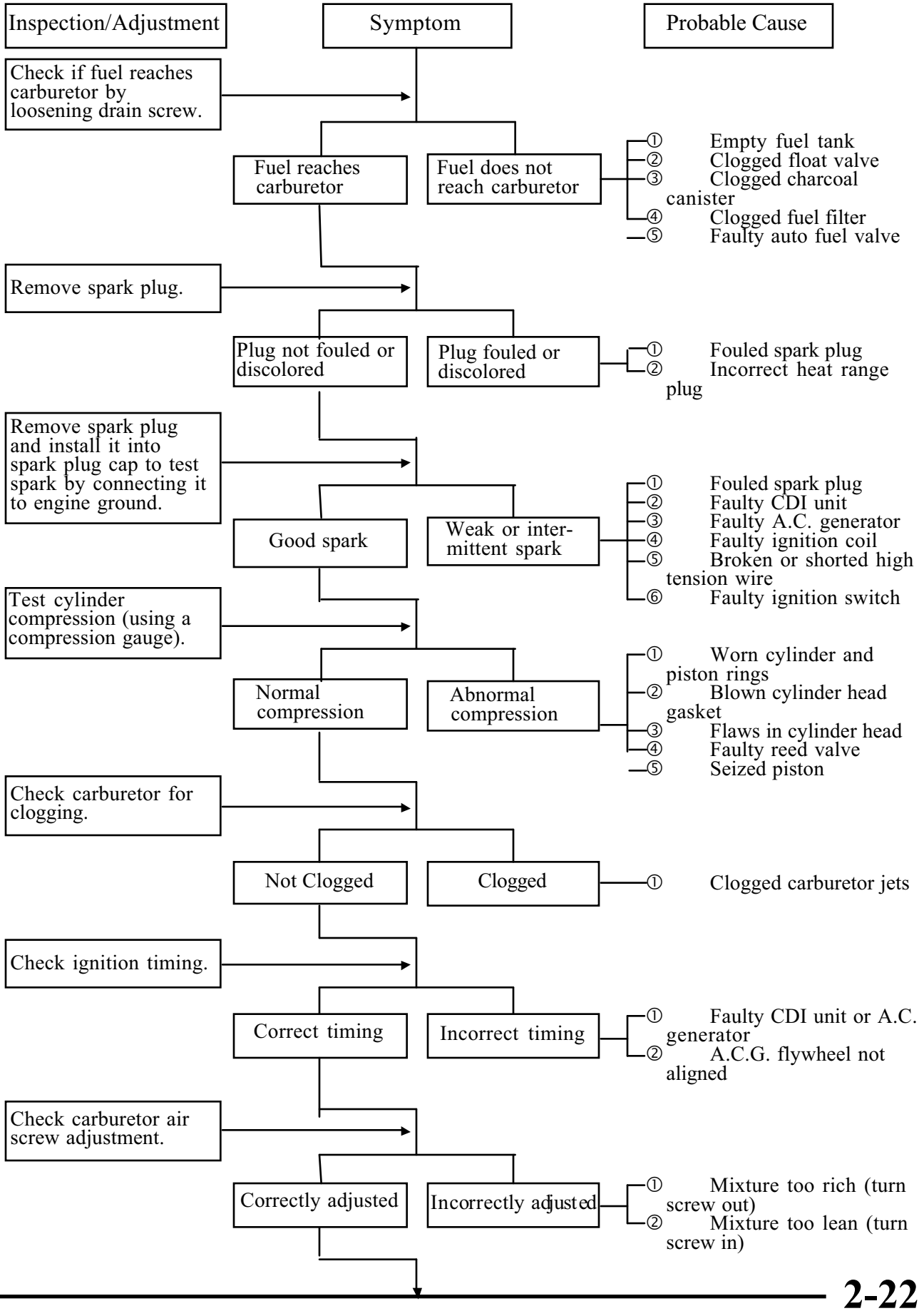

Fuel Unit
Oil Meter
Oil Tank Cap
Fuel Tube
Fuel Filter
Oil Filter
Oil Tube
Ignition Coil
Spark Plug Cap
Fuel Tank Cap
Auto Bystarter
Vacuum Tee
Oil Pump
Control Cable
Throttle Cable

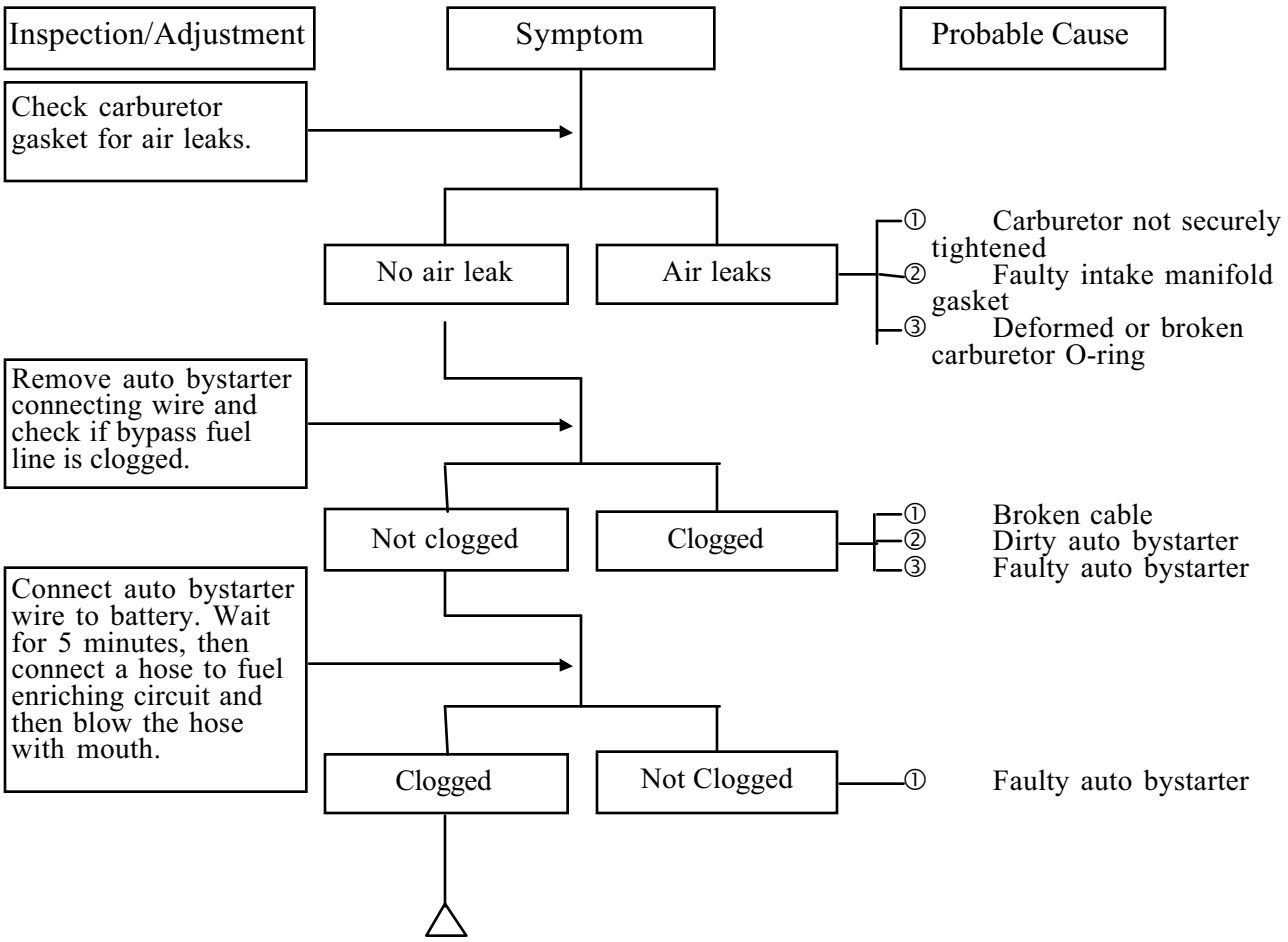
TROUBLESHOOTING

ENGINE WILL NOT START OR IS HARD TO START

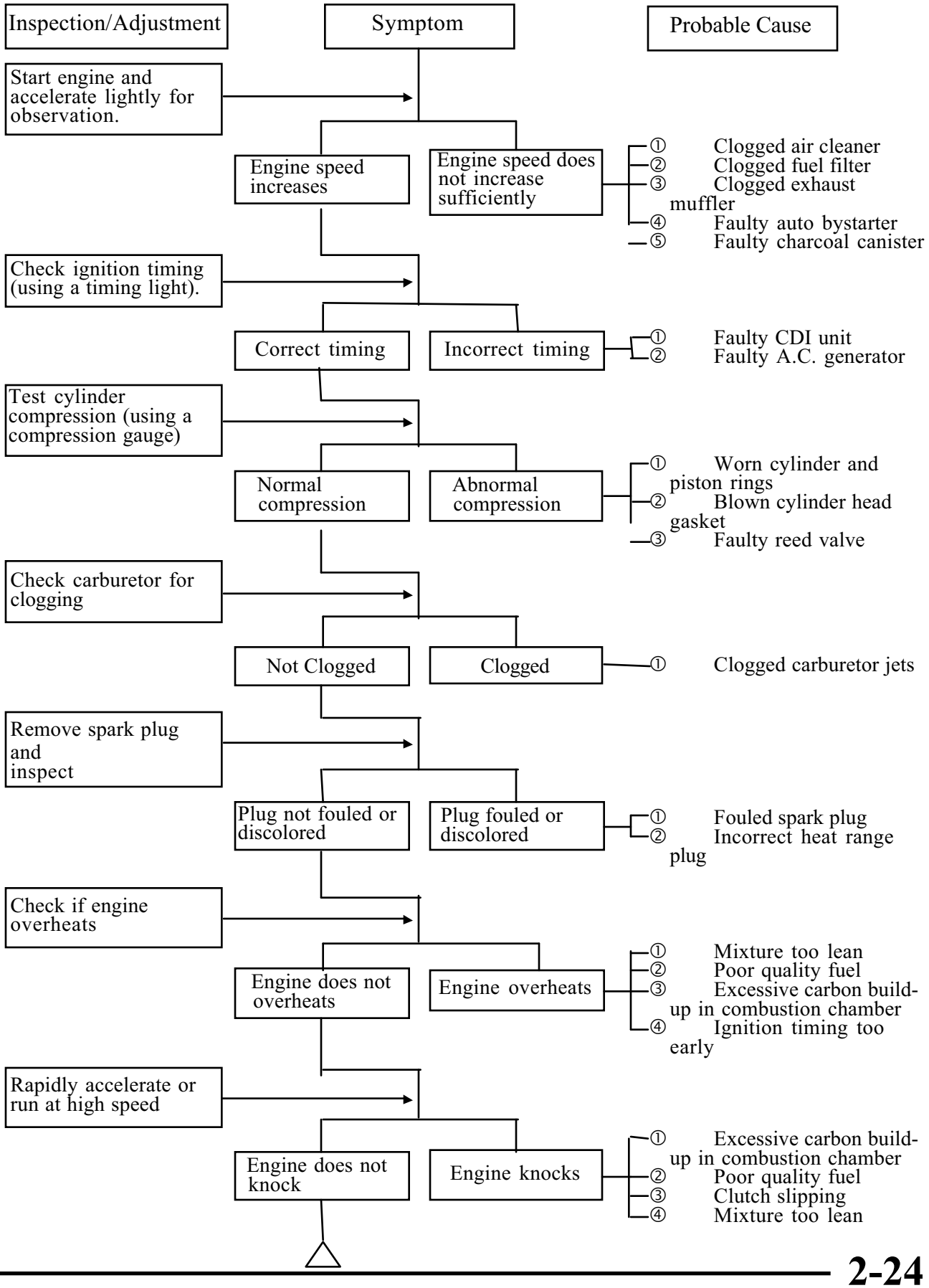

Inspection/Adjustment
Symptom
Probable Cause
Check if fuel reaches carburetor by loosening drain screw.
Fuel reaches carburetor
Fuel does not reach carburetor
① Empty fuel tank
② Clogged float valve
③ Clogged charcoal canister
④ Clogged fuel filter
⑤ Faulty auto fuel valve
Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.
Spark jumps
Weak or no spark
① Faulty spark plug
② Fouled spark plug
③ Faulty CDI unit
④ Faulty A.C. generator
⑤ Broken or shorted ignition coil
⑥ Broken or shorted exciter coil
⑦ Faulty ignition switch
Test cylinder compression.
Normal compression
Low or no compression
① Burned or worn cylinder piston
② Faulty reed valve
③ Blown cylinder head gasket
④ Leaking crankcase
⑤ Faulty crankcase oil seal
Start engine by following normal starting procedure.
Engine does not fire
Engine fires but does not start
① Incorrectly adjusted idle speed
② Air leaking through intake pipe
③ Incorrect ignition timing
Remove spark plug and inspect again.
Dry spark plug
Wet spark plug
① Flooded carburetor
② Throttle valve excessively open
Wait for 30 minutes and then remove the carbu-retor auto choke circuit hose and blow the hose with mouth.
Not clogged
Clogged
① Faulty auto bystarter

ENGINE STOPS IMMEDIATELY AFTER IT STARTS

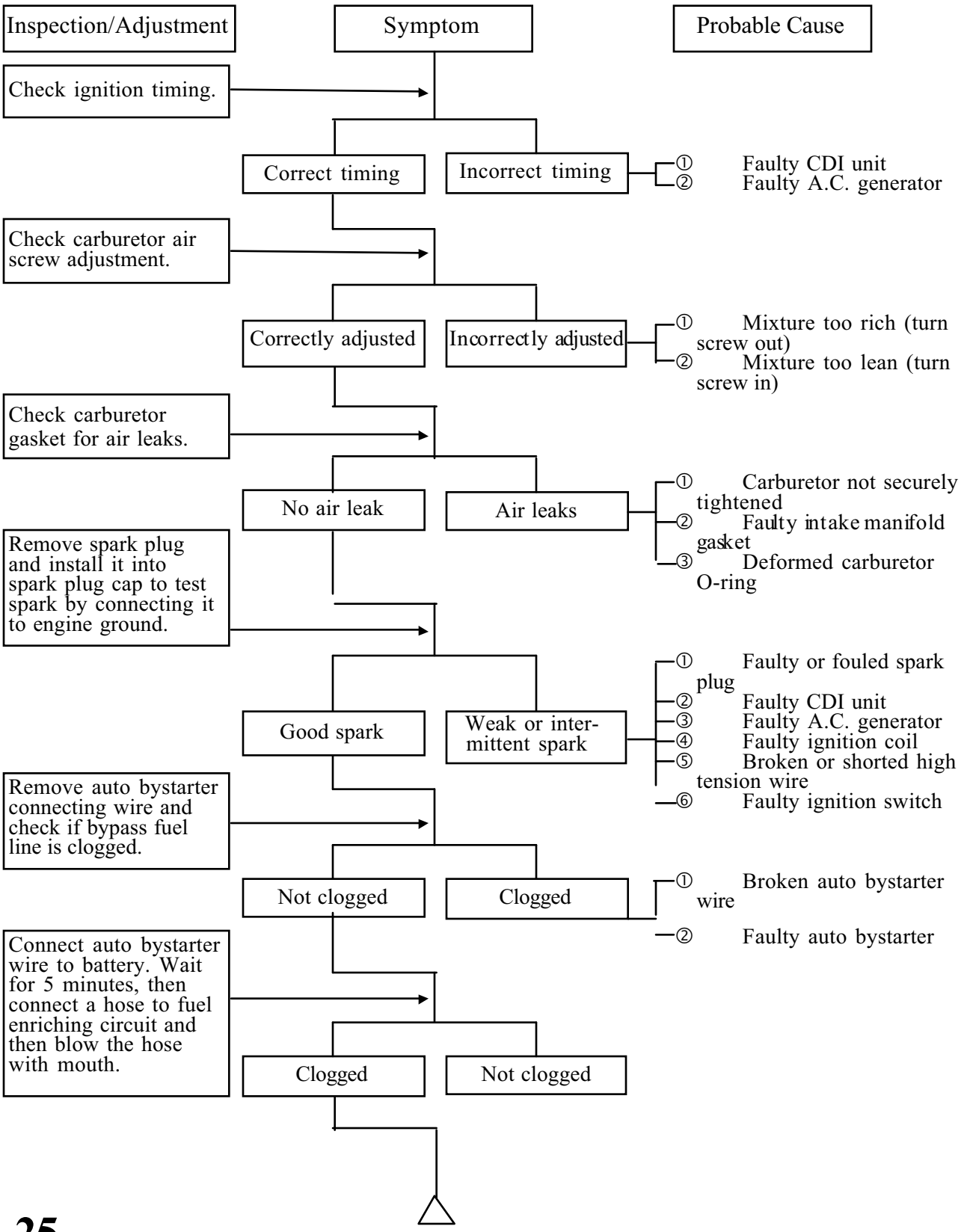

Inspection/Adjustment
Symptom
Probable Cause
Check if fuel reaches carburetor by loosening drain screw.
Fuel reaches carburetor
Fuel does not reach carburetor
① Empty fuel tank
② Clogged float valve
③ Clogged charcoal canister
④ Clogged fuel filter
⑤ Faulty auto fuel valve
Remove spark plug.
Plug not fouled or discolored
Plug fouled or discolored
① Fouled spark plug
② Incorrect heat range plug
Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.
Good spark
Weak or inter-mittent spark
① Fouled spark plug
② Faulty CDI unit
③ Faulty A.C. generator
④ Faulty ignition coil
⑤ Broken or shorted high tension wire
⑥ Faulty ignition switch
Test cylinder compression (using a compression gauge).
Normal compression
Abnormal compression
① Worn cylinder and piston rings
② Blown cylinder head gasket
③ Flaws in cylinder head
④ Faulty reed valve
⑤ Seized piston
Check carburetor for clogging.
Not Clogged
Clogged
① Clogged carburetor jets
Check ignition timing.
Correct timing
Incorrect timing
① Faulty CDI unit or A.C. generator
② A.C.G. flywheel not aligned
Check carburetor air screw adjustment.
Correctly adjusted
Incorrectly adjusted
① Mixture too rich (turn screw out)
② Mixture too lean (turn screw in)


Inspection/Adjustment
Symptom
Probable Cause
Check carburetor gasket for air leaks.
No air leak
Air leaks
① Carburetor not securely tightened
② Faulty intake manifold gasket
③ Deformed or broken carburetor O-ring
Remove auto bystarter connecting wire and check if bypass fuel line is clogged.
Not clogged
Clogged
① Broken cable
② Dirty auto bystarter
③ Faulty auto bystarter
Connect auto bystarter wire to battery. Wait for 5 minutes, then connect a hose to fuel enriching circuit and then blow the hose with mouth.
Clogged
Not Clogged
① Faulty auto bystarter

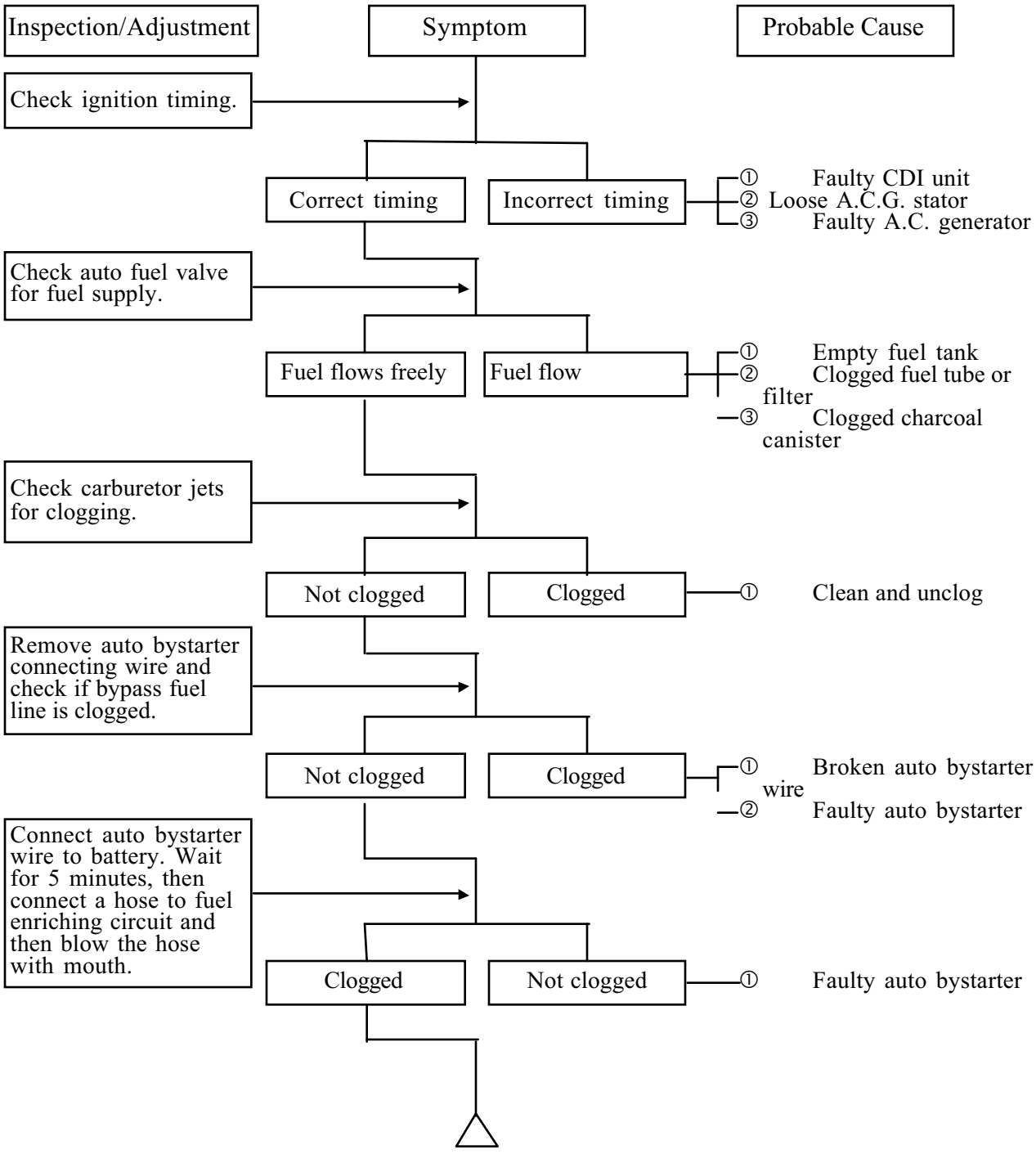
ENGINE LACKS POWER


Inspection/Adjustment
Symptom
Probable Cause
Start engine and accelerate lightly for observation.
Engine speed increases
Engine speed does not increase sufficiently
① Clogged air cleaner
② Clogged fuel filter
③ Clogged exhaust muffler
④ Faulty auto bystarter
⑤ Faulty charcoal canister
Check ignition timing (using a timing light).
Correct timing
Incorrect timing
① Faulty CDI unit
② Faulty A.C. generator
Test cylinder compression (using a compression gauge)
Normal compression
Abnormal compression
① Worn cylinder and piston rings
② Blown cylinder head gasket
③ Faulty reed valve
Check carburetor for clogging
Not Clogged
Clogged
① Clogged carburetor jets
Remove spark plug and inspect
Plug not fouled or discolored
Plug fouled or discolored
① Fouled spark plug
② Incorrect heat range plug
Check if engine overheats
Engine does not overheats
Engine overheats
① Mixture too lean
② Poor quality fuel
③ Excessive carbon build-up in combustion chamber
④ Ignition timing too early
Rapidly accelerate or run at high speed
Engine does not knock
Engine knocks
① Excessive carbon build-up in combustion chamber
② Poor quality fuel
③ Clutch slipping
④ Mixture too lean

POOR PERFORMANCE (ESPECIALLY AT IDLE AND LOW SPEEDS)


Inspection/Adjustment
Symptom
Probable Cause
Check ignition timing.
Correct timing
Incorrect timing
① Faulty CDI unit
② Faulty A.C. generator
Check carburetor air screw adjustment.
Correctly adjusted
Incorrectly adjusted
① Mixture too rich (turn screw out)
② Mixture too lean (turn screw in)
Check carburetor gasket for air leaks.
No air leak
Air leaks
① Carburetor not securely tightened
② Faulty intake manifold gasket
③ Deformed carburetor O-ring
Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.
Good spark
Weak or inter-mittent spark
① Faulty or fouled spark plug
② Faulty CDI unit
③ Faulty A.C. generator
④ Faulty ignition coil
⑤ Broken or shorted high tension wire
⑥ Faulty ignition switch
Remove auto bystarter connecting wire and check if bypass fuel line is clogged.
Not clogged
Clogged
① Broken auto bystarter wire
② Faulty auto bystarter
Connect auto bystarter wire to battery. Wait for 5 minutes, then connect a hose to fuel enriching circuit and then blow the hose with mouth.
Clogged
Not clogged

POOR PERFORMANCE (AT HIGH SPEED)


Inspection/Adjustment
Symptom
Probable Cause
Check ignition timing.
Correct timing
Incorrect timing
① Faulty CDI unit
② Loose A.C.G. stator
③ Faulty A.C. generator
Check auto fuel valve for fuel supply.
Fuel flows freely
Fuel flow
① Empty fuel tank
② Clogged fuel tube or filter
③ Clogged charcoal canister
Check carburetor jets for clogging.
Not clogged
Clogged
① Clean and unclog
Remove auto bystarter connecting wire and check if bypass fuel line is clogged.
Not clogged
Clogged
① Broken auto bystarter wire
② Faulty auto bystarter
Connect auto bystarter wire to battery. Wait for 5 minutes, then connect a hose to fuel enriching circuit and then blow the hose with mouth.
Clogged
Not clogged
① Faulty auto bystarter

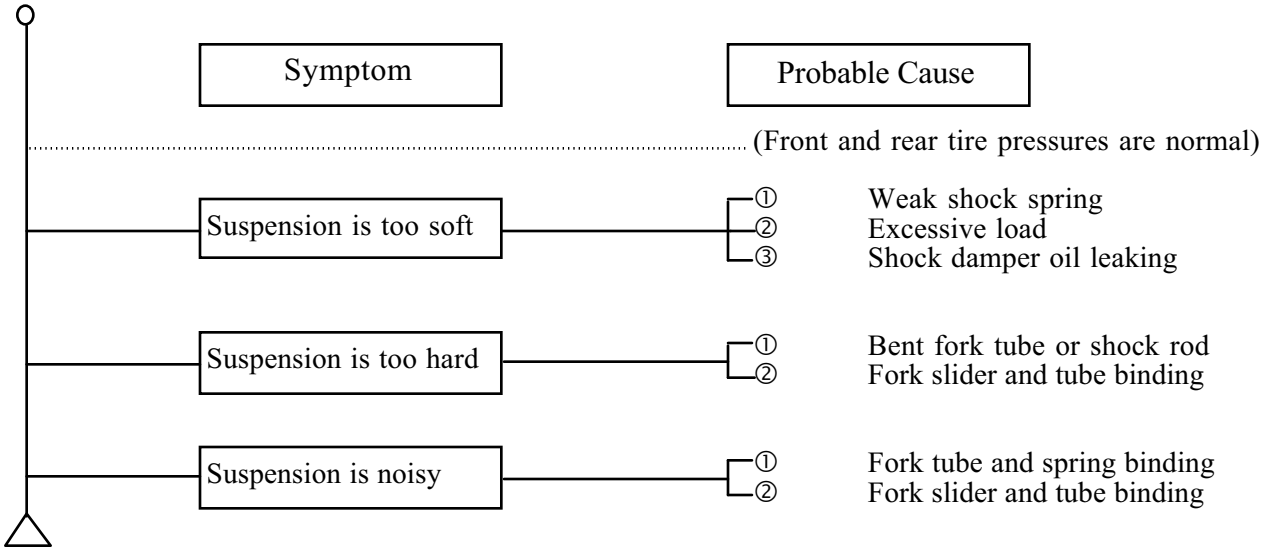
CLUTCH, DRIVE AND DRIVEN PULLEYS

Symptom	Probable Cause
Engine starts but motor-cycle does not move	① Worn or slipping drive belt ② Broken ramp plate ③ Broken driven face spring ④ Separated clutch lining ⑤ Damaged driven pulley shaft splines ⑥ Damaged final gear ⑦ Seized final gear
Motorcycle creeps or engine starts but soon stops or seems to rush out (Rear wheel rotates when engine idles)	① Broken shoe spring ② Clutch outer and clutch weight stuck ③ Seized pivot
Engine lacks power at start of a grade (poor slope performance)	① Worn or slipping drive belt ② Worn weight rollers ③ Seized drive pulley bearings ④ Weak driven face spring ⑤ Worn or seized driven pulley bearings
Engine lacks power at high speed	① Worn or slipping drive belt ② Worn weight rollers ③ Worn or seized driven pulley bearings
There is abnormal noise or smell while running	① Oil or grease fouled drive belt ② Worn drive belt ③ Weak driven face spring ④ Worn or seized driven pulley bearings

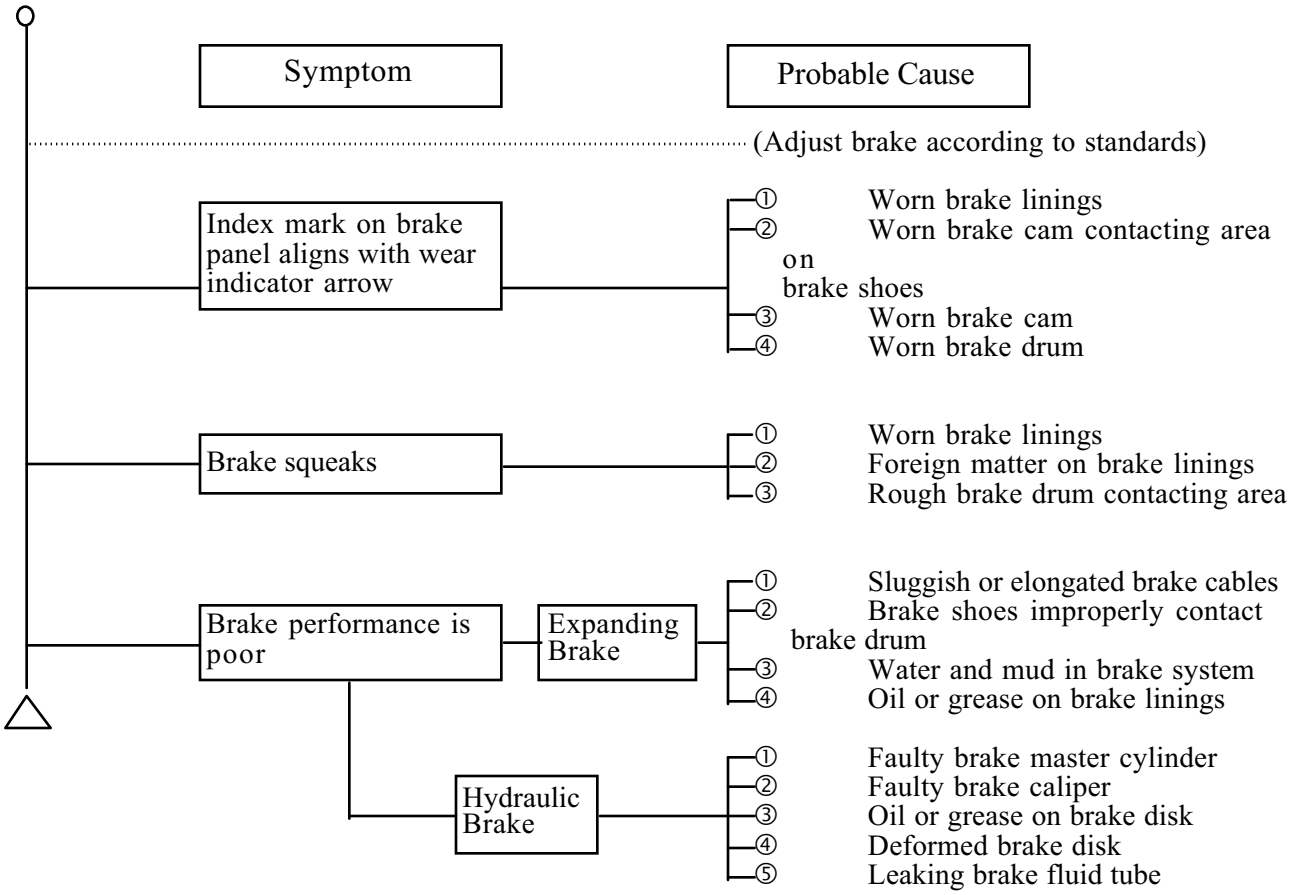
STEERING HANDLEBAR DOES NOT TRACK STRAIGHT

Symptom	Probable Cause
(Front and rear tire pressures are normal)	
Steering is heavy	① Steering stem nut too tight ② Broken steering steel balls
Front or rear wheel is wobbling	① Excessive wheel bearing play ② Bent rim ③ Loose axle nut
Steering handlebar pulls to one side	① Misaligned front and rear wheels ② Bent front fork

POOR SUSPENSION PERFORMANCE

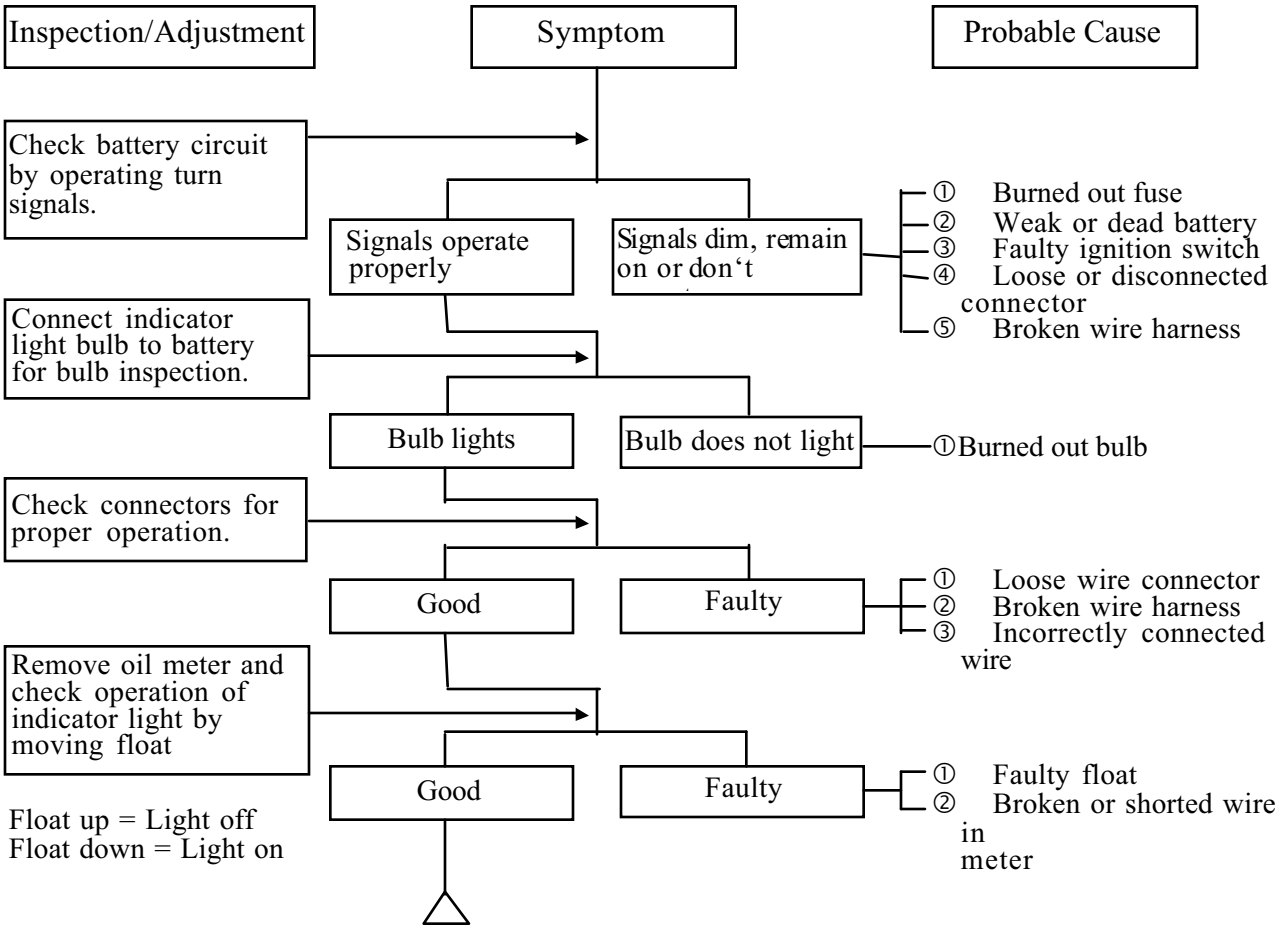

Symptom
Probable Cause
(Front and rear tire pressures are normal)
Suspension is too soft
① Weak shock spring
② Excessive load
③ Shock damper oil leaking
Suspension is too hard
① Bent fork tube or shock rod
② Fork slider and tube binding
Suspension is noisy
① Fork tube and spring binding
② Fork slider and tube binding

POOR BRAKE PERFORMANCE

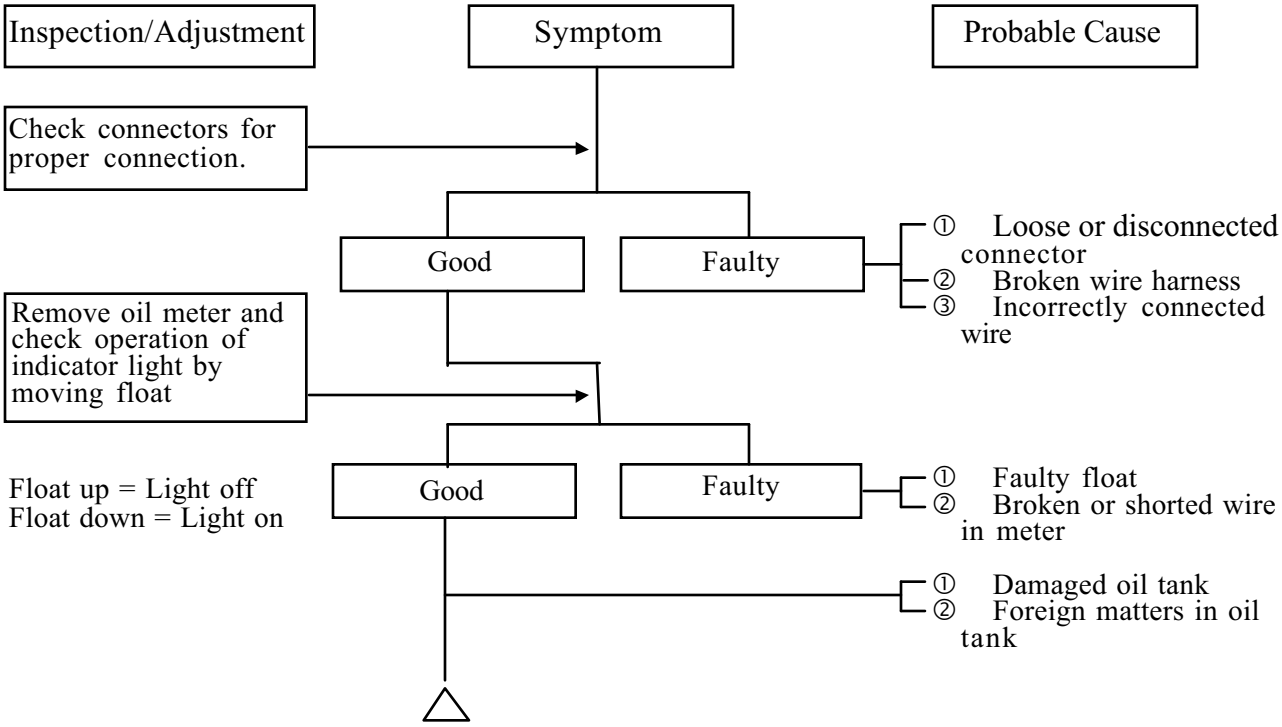

Symptom
Probable Cause
(Adjust brake according to standards)
Index mark on brake panel aligns with wear indicator arrow
① Worn brake linings
② Worn brake cam contacting area on brake shoes
③ Worn brake cam
④ Worn brake drum
Brake squeaks
① Worn brake linings
② Foreign matter on brake linings
③ Rough brake drum contacting area
Brake performance is poor
Expanding Brake
① Sluggish or elongated brake cables
② Brake shoes improperly contact brake drum
③ Water and mud in brake system
④ Oil or grease on brake linings
Hydraulic Brake
① Faulty brake master cylinder
② Faulty brake caliper
③ Oil or grease on brake disk
④ Deformed brake disk
⑤ Leaking brake fluid tube

OIL METER

1. Motor oil indicator light does not come on when there is no motor oil (Ignition switch ON)

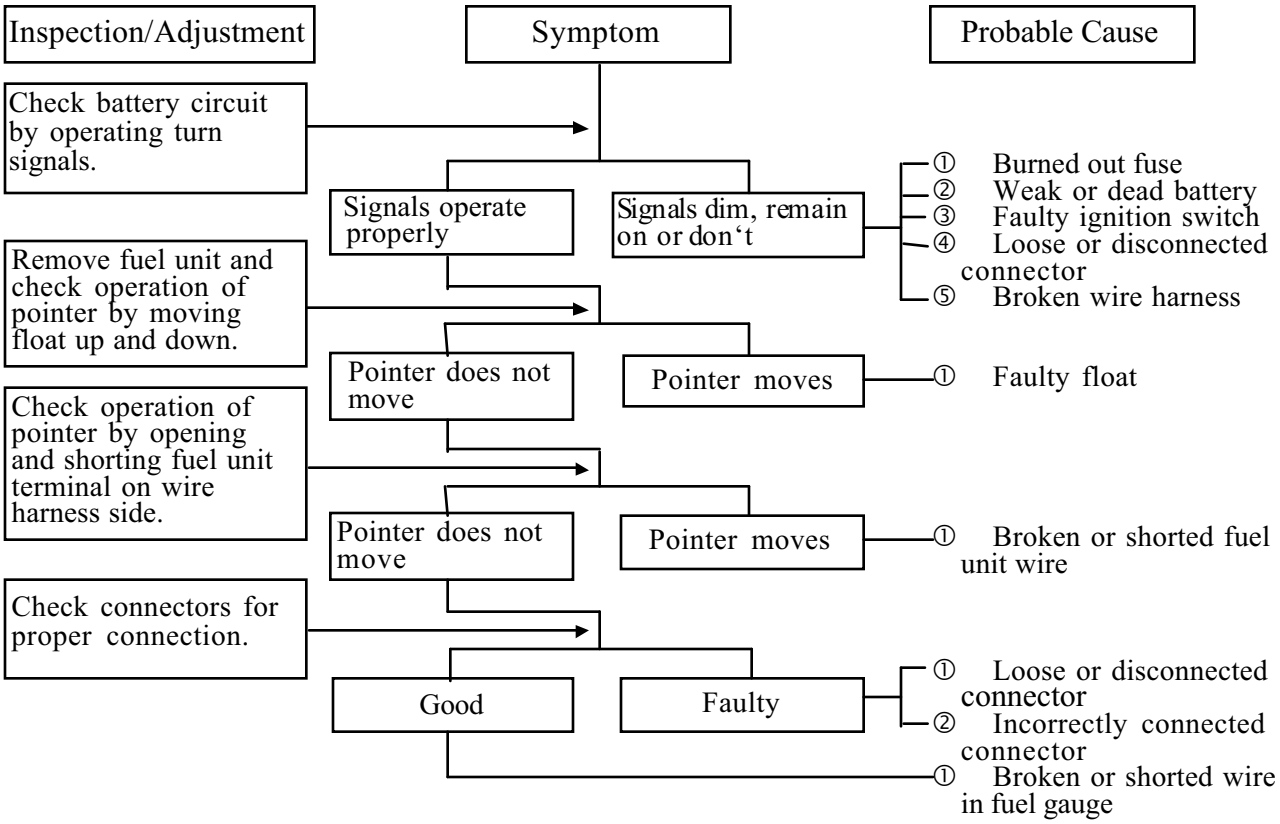

Inspection/Adjustment
Symptom
Probable Cause
Check battery circuit by operating turn signals.
Signals operate properly
Signals dim, remain on or don't
① Burned out fuse
② Weak or dead battery
③ Faulty ignition switch
④ Loose or disconnected connector
⑤ Broken wire harness
Connect indicator light bulb to battery for bulb inspection.
Bulb lights
Bulb does not light
①Burned out bulb
Check connectors for proper operation.
Good
Faulty
① Loose wire connector
② Broken wire harness
③ Incorrectly connected wire
Remove oil meter and check operation of indicator light by moving float
Good
Faulty
① Faulty float
② Broken or shorted wire in meter
Float up = Light off
Float down = Light on

2. Motor oil is sufficient but the indicator light remains on (Ignition switch ON)

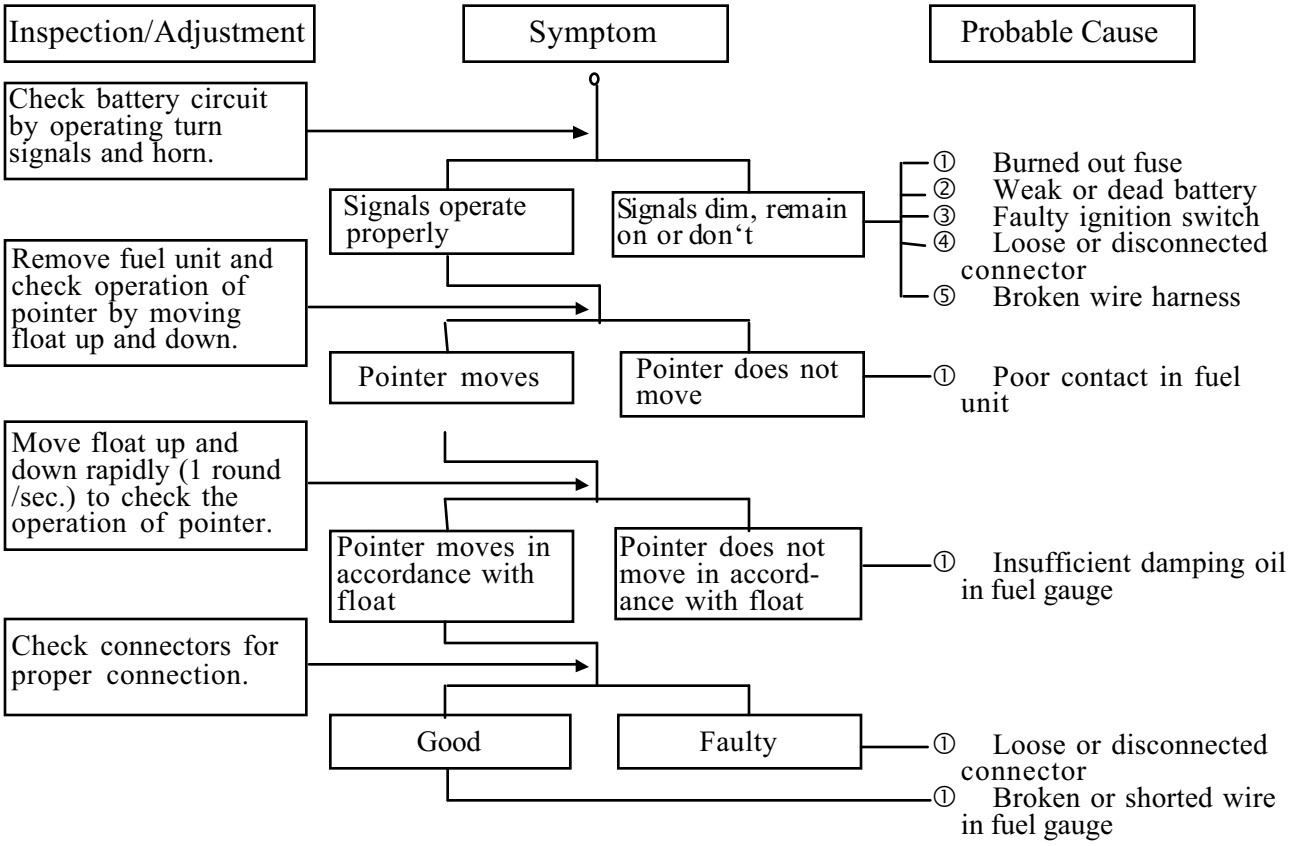


FUEL GAUGE

1. Pointer does not register correctly (Ignition switch ON)

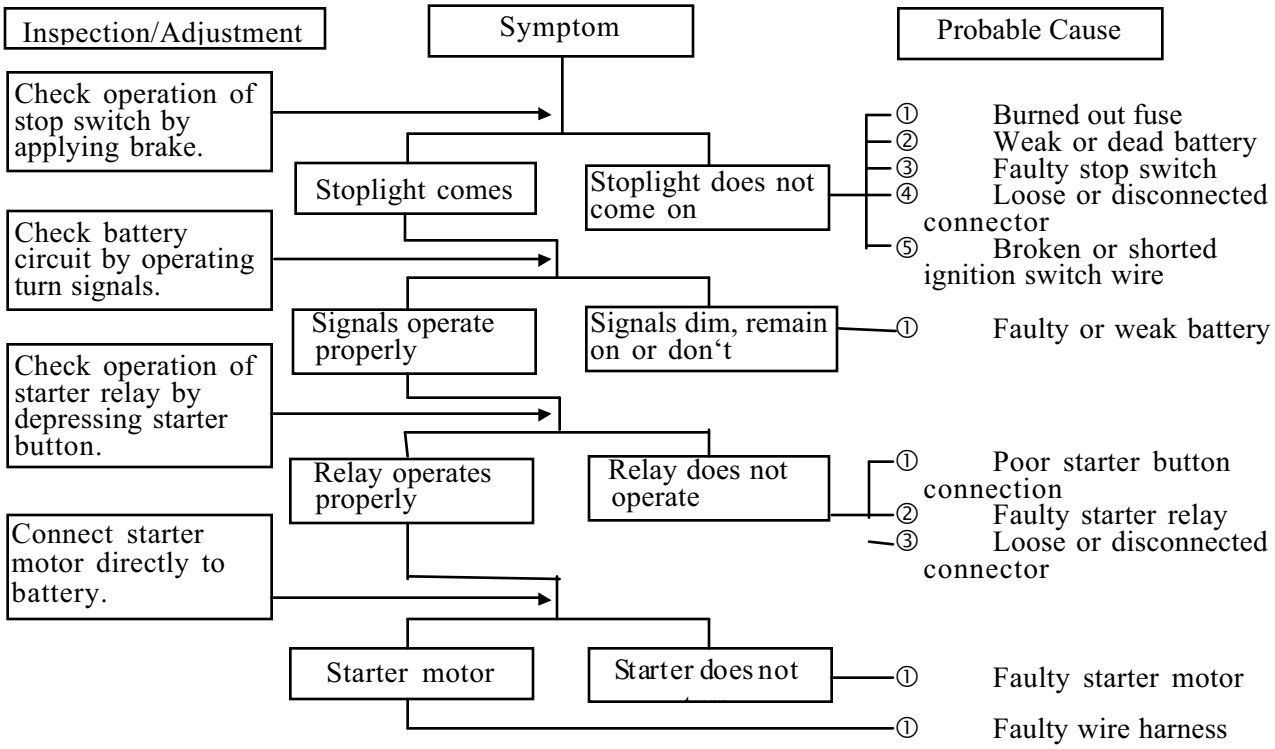

Inspection/Adjustment
Symptom
Probable Cause
Check battery circuit by operating turn signals.
Signals operate properly
Signals dim, remain on or don't
① Burned out fuse
② Weak or dead battery
③ Faulty ignition switch
④ Loose or disconnected connector
⑤ Broken wire harness
Remove fuel unit and check operation of pointer by moving float up and down.
Pointer does not move
Pointer moves
① Faulty float
Check operation of pointer by opening and shorting fuel unit terminal on wire harness side.
Pointer does not move
Pointer moves
① Broken or shorted fuel unit wire
Check connectors for proper connection.
Good
Faulty
① Loose or disconnected connector
② Incorrectly connected connector
① Broken or shorted wire in fuel gauge

2. Pointer fluctuates or swings (Ignition switch ON)

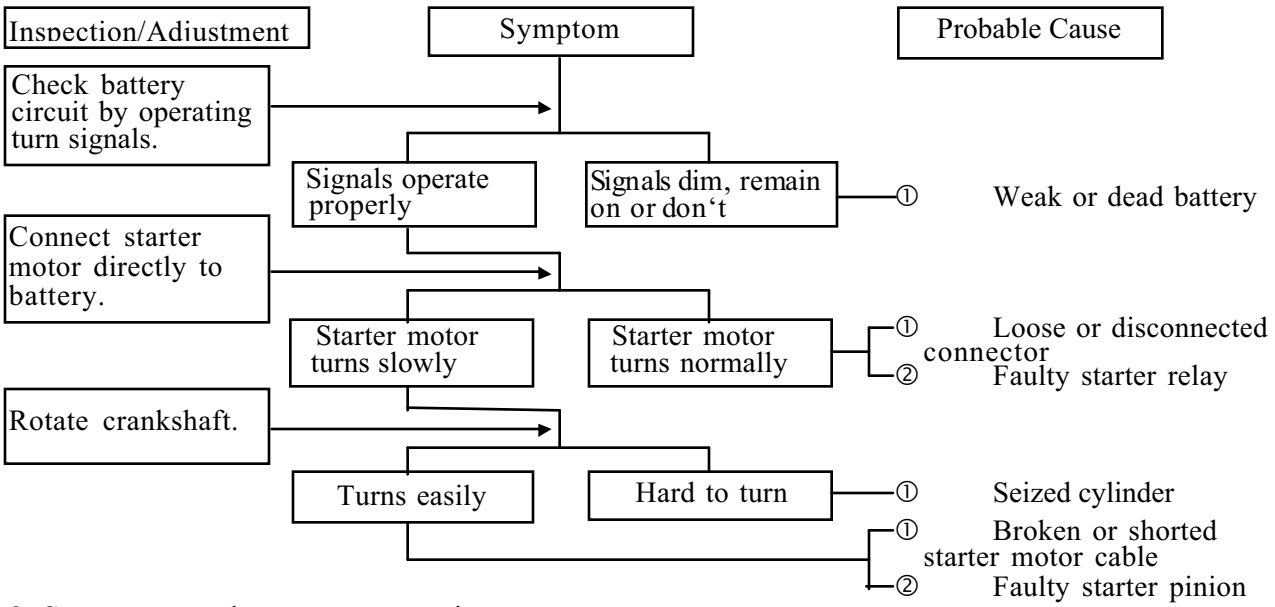

Inspection/Adjustment
Symptom
Probable Cause
Check battery circuit by operating turn signals and horn.
Signals operate properly
Signals dim, remain on or don't
① Burned out fuse
② Weak or dead battery
③ Faulty ignition switch
④ Loose or disconnected connector
⑤ Broken wire harness
Remove fuel unit and check operation of pointer by moving float up and down.
Pointer moves
Pointer does not move
① Poor contact in fuel unit
Move float up and down rapidly (1 round /sec.) to check the operation of pointer.
Pointer moves in accordance with float
Pointer does not move in accord-ance with float
① Insufficient damping oil in fuel gauge
Check connectors for proper connection.
Good
Faulty
① Loose or disconnected connector
① Broken or shorted wire in fuel gauge

STARTER MOTOR

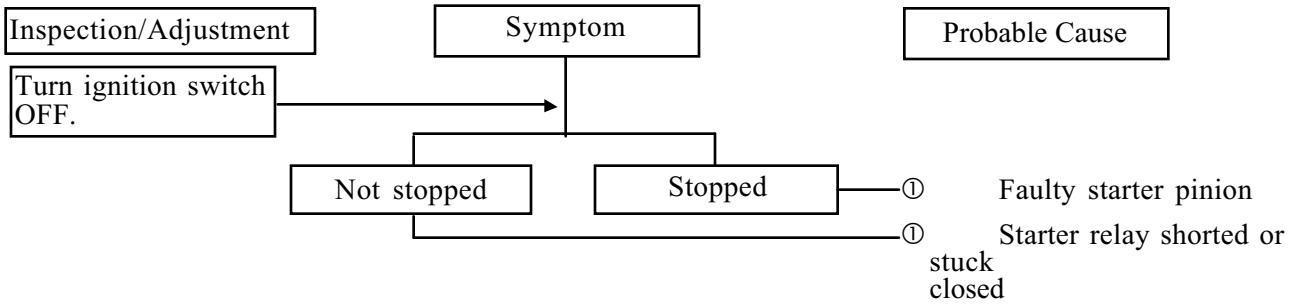
1. Starter motor won't turn


Inspection/Adjustment
Symptom
Probable Cause
Check operation of stop switch by applying brake.
Stoplight comes
Stoplight does not come on
① Burned out fuse
② Weak or dead battery
③ Faulty stop switch
④ Loose or disconnected connector
⑤ Broken or shorted ignition switch wire
Check battery circuit by operating turn signals.
Signals operate properly
Signals dim, remain on or don't
① Faulty or weak battery
Check operation of starter relay by depressing starter button.
Relay operates properly
Relay does not operate
① Poor starter button connection
② Faulty starter relay
③ Loose or disconnected connector
Connect starter motor directly to battery.
Starter motor
Starter does not
① Faulty starter motor
① Faulty wire harness

2. Starter motor turns slowly or idles



3. Starter motor does not stop turning



3

INSPECTION/ADJUSTMENT

INSPECTION AND MAINTENANCE SCHEDULE..... 3- 1
BRAKE SYSTEM 3- 4
MOVING DEVICE..... 3- 6
DAMPING DEVICE..... 3- 7
POWER DRIVE SYSTEM 3- 7
ELECTRICAL EQUIPMENT..... 3- 8
ENGINE..... 3- 9
OTHERS 3-12

INSPECTION AND MAINTENANCE SCHEDULE

(Note) 1. ○ means time for inspection.

2. ☆ means regular replacement for the specified parts.

This inspection and maintenance schedule is based upon average riding conditions. Machines subjected to serve use, or ridden in unusually dusty areas, require more frequent servicing.

Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks
			Preride	1st month	Every 6 months	Every 12 months		
Suspension	Steering handlebar	Check for looseness and vertical play				○		
		Operating performance	○			○		
		Right/left turning angle				○		
	Front fork	Damage			○	○		
		Check for front fork pivot installation			○	○		Check steering stem
		Check front fork pivot for looseness and abnormal noise				○		Check steering stem
Brake System	Brake Lever	Front/rear brake lever free play			○	○	Free play: 10_ 20mm	
		Brake lever operation	○					
		Brake performance		○	○	○		
	Lever/ Cable	Looseness, abnormal noise and damage		○		○		
	Brake drum/ shoe	Drum-to-lining clearance			○	○		
		Brake shoe and lining wear				☆		Indicator type
		Brake drum wear and damage				○	Standard: Rear : 110 mm Service Limits: Rear : 111 mm	
Moving Device	Tire	Tire pressure	○		○	○	<table><tr><td></td><td>Front</td><td>Rear</td></tr><tr><td>1 rider</td><td>1.50 kg/cm_</td><td>1.75 kg/cm_</td></tr><tr><td>Tire Size</td><td>70/90-16</td><td>90/80-16</td></tr></table>	

3. INSPECTION/ADJUSTMENT

Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks
			Preride	1st month	Every 6 months	Every 12 months		
Moving Device	Motor-cycle	Tire crack and damage	○		○	○		
		Tire groove and abnormal wear	○		○	○	Groove Depth: Front: 0.8mm Rear : 0.8mm	
		Imbedded objects, gravel, etc.	○		○	○		
		Axle nut looseness			○	○	Torque Values: Front axle nut 5.0_ 7.0kg-m Rear axle nut 11.0_ 13.0kg-m	Axle nut torque
		Check wheel rim, rim edge and spoke plate for damage		○		○	Rim runout at rim end: Front: Axial 2.0mm Radial 2.0mm Rear: Axial 2.0mm Radial 2.0mm	
		Check front wheel bear-ing for excessive play and abnormal noise				○		
		Check front wheel bear-ing for excessive play and abnormal noise				○		
Damping Device	Frame Spring	Damage						Shock spring free length
	Suspen-sion arm	Connecting parts loose-ness and arm damage				○		
	Shock absorber	Oil leakage and damage				○		
		Assembly parts loose-ness abnormal noise				○		
Power Drive System	Clutch	Operation		○	○	○		
	Transmis-sion case	Oil leakage and oil level			○	○	Oil level: Oil check bolt hole at lower hole edge	Rear wheel transmis-sion case
Electrical Equipment	Ignition device	Spark plug condition			○	○	Plug gap: 0.6_ 0.7mm	
	Battery	Terminal connection				○		
	Wires	Loose connection and damage				○		

3. INSPECTION/ADJUSTMENT

Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks
			Preride	1st month	Every 6 months	Every 12 months		
Engine	Body	Performance and abnormal noise			○	○		
		Conditions at low and high speeds		○	○	○		
		Exhaust smoke			○	○		
		Air cleaner			○	○		
	Lubrication system	Oil quality and quantity			○	○	❒ Oil level indicator Indicator light comes on when oil is insufficient	
		Oil leakage			○	○		
		Oil level	○					
		Check oil filter for clogging				○		
	Fuel System	Fuel leakage						
		Carburetor, throttle valve and auto bystarter				○		
		Check fuel filter for clogging				○		
		Fuel level	○					
		Fuel tube replacement					☆ Every 4 years	
Lights & Winker		Operation						
		Winking action, dirt and damage	○					
Buzzer & Steering Lock		Operation				○		
Rearview Mirror & Reflector		Rearview mirror position	○					Rearview Mirror
Reflector & License Plate		Dirt and damage	○					
Counter		Operation				○		
Exhaust Muffler		Joint looseness and damage				○		
		Exhaust muffler performance				○		
Body & Frame		Looseness and damage				○		
Abnormal Conditions Happened Last Time		Check if the abnormal conditions occur again	○					
Others		Lubrication points			○	○		
		Remove carbon deposits on combustion chamber, breather hole and exhaust muffler				○		

BRAKE SYSTEM

BRAKE LEVER

《 Free Play》

Measure the front and rear brake lever free plays.

Free Play: Front: 10_ 20mm
Rear: 10_ 20mm

Front 10_ 20mm

Rear 10_ 20mm

If the free plays do not fall within the limits, turn the right and left adjusting nuts for adjustment.

<Rear> "△ " Marks

Adjusting Nuts

BRAKE DRUM/SHOE

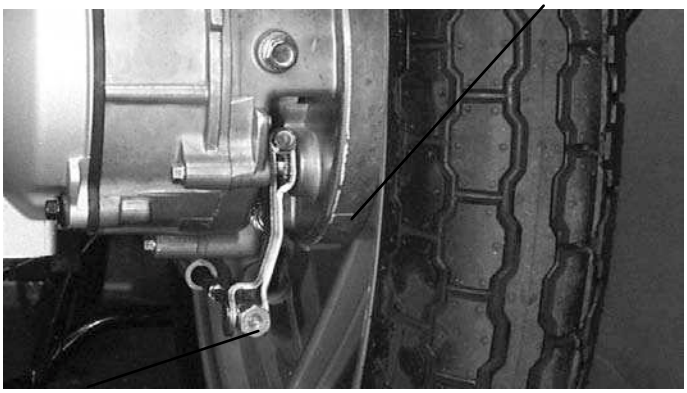
《 Brake Shoe Wear》

Replace the brake shoes if the arrow on the brake arm aligns with reference mark"△ " on the brake panel when the brake is fully applied.

《 Brake Drum Wear/Damage》

Check the brake drum appearance for damage. Check if the brake lining wear is within the specified service limit. Check the brake operation for abnormal noise and brake drum inside for wear or damage.

<Rear> "△ " Marks



Adjusting Nuts

BRAKE DISK/LINING

《 Brake Disk Surface and Brake Pad Wear》

Check the brake disk surface for scratch. Check if the brake pad wear is within the specified service limit.

《 Brake Disk Runout Inspection》

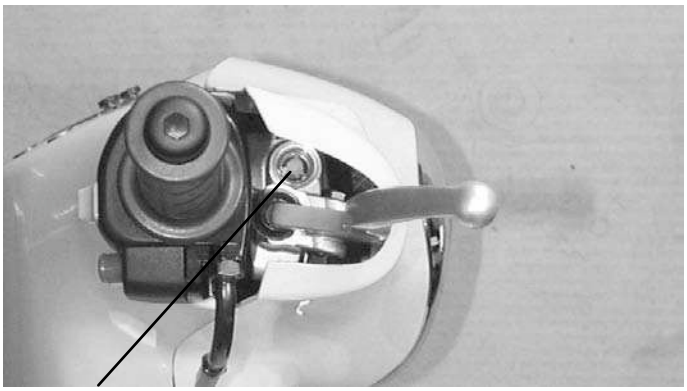
Jack the motorcycle wheels off the ground and check if the brake disk runout is within the specified service limit.

Brake Disk

BRAKE FLUID LEVEL INSPECTION

《 Brake Master Cylinder Fluid Level Inspection》

Turn the steering handlebar upright and check if the front brake fluid level is within the specified limits through the front brake master cylinder check hole.



Brake Master Cylinder

MOVING DEVICE

TIRES

《 Tire Pressure》

Check the tire pressure.

✱ Tire pressure should be checked when tires are cold.

Tire Pressure (one rider)

Front: 1.50 kg/cm_

Rear: 1.75 kg/cm_

Tire Size

Front	70/90 – 16
Rear	90/80 – 16

《 Axle Nut/Axle Shaft Looseness》

Check the front and rear axle nuts for looseness.
If the axle nuts are loose, tighten them to the specified torques.

Torques:

Front: 5.0_ 7.0kg-m

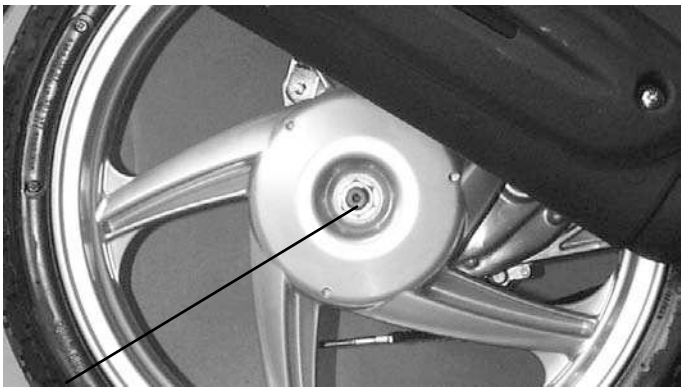
Rear: 11.0_ 13.0kg-m

Axle Nut

《 Wheel Rim/Spoke Plate Damage》

Check the wheel rim and spoke plate for wear or damage and measure the rim runout.

Rear Wheel



Axle Nut

DAMPING DEVICE

SHOCK ABSORBERS

《 Oil Leak/Damage》

Fully apply the front brake and check the action of the front shock absorber by compressing it several times.
Check the entire shock absorber assembly for looseness or damage.
Check the action of the rear shock absorber by compressing it several times.
Check the entire shock absorber assembly for looseness or damage.

POWER DRIVE SYSTEM

TRANSMISSION CASE

Check the rear wheel transmission case surrounding area for oil leaks.
Stop the engine and remove the oil check bolt.

✱ Place the motorcycle on its main stand on level ground.

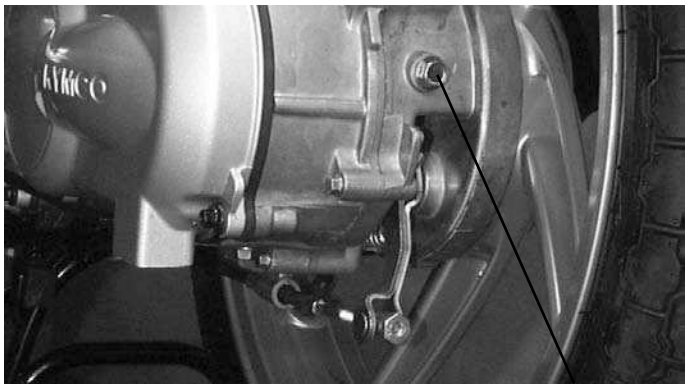
The gear oil level shall be at the oil check bolt hole. If the oil level is low, add the specified oil to the proper level.

Specified Gear Oil: SAE10W90#

Install and tighten the oil check bolt.

Torque: 1.0_ 1.5kg-m

Start the engine and check for oil leaks.



Oil Check Bolt

ELECTRICAL EQUIPMENT

IGNITION APPARATUS

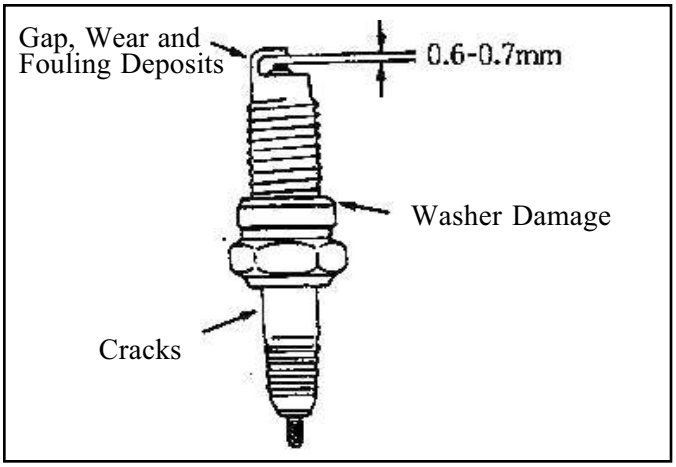
《 Spark Plug》

Remove the frame center cover.
Remove the spark plug cap and spark plug.
Check the spark plug for wear, fouling and carbon deposits.
Remove the fouling and carbon deposits with a spark plug cleaner or wire brush.

Specified Spark Plug

NGK
BA10AB.AC.
BR8HSA

Spark Plug Gap: 0.6_ 0.7mm

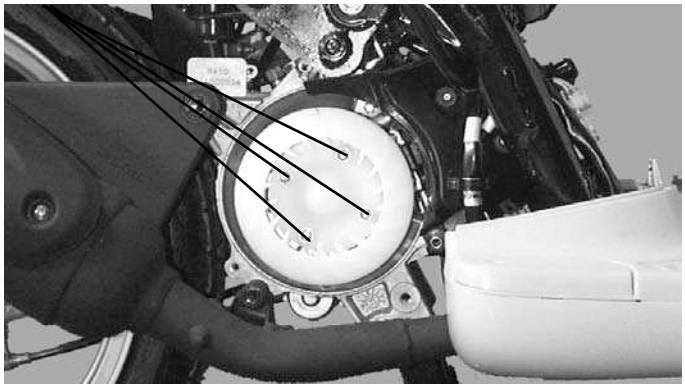


《 Ignition Apparatus》

✱ The CDI ignition timing is not adjustable. If the timing is incorrect, check the CDI unit, ignition coil and A.C. generator and replace any faulty parts.

Remove the right side rail. (⇨12-4)
Remove the A.C. generator fan cover. (⇨7-3)
Remove the four bolts attaching the fan and then remove the fan.
Warm up the engine and check the ignition timing with a timing light.

Bolt

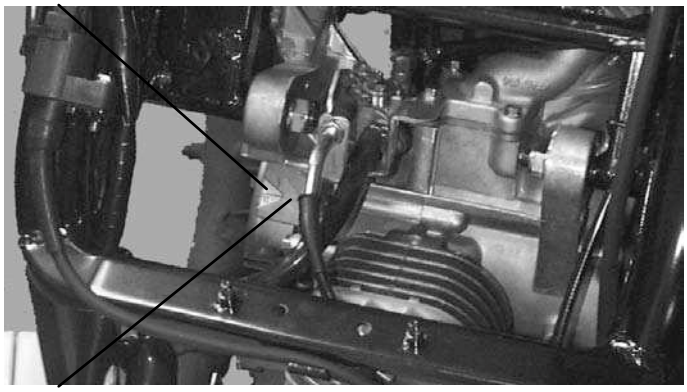


When the engine is running at the specified rpm, the ignition timing is correct if the “F” mark on the flywheel aligns with the index mark on the crankcase within ±1.5 .

Ignition Timing:

BA10AB.AC.:
8 ~ 14 ±1.5 BTDC/2000rpm

F Mark



Index Mark

ENGINE

BODY

《 At High and Low Speeds》

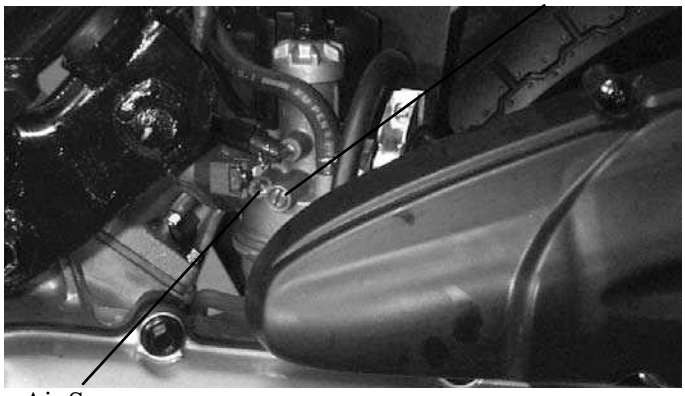
* The engine must be warm for accurate idle speed adjustment.

Adjust the idle speed to the specified range by turning the throttle stop screw and air screw.

Idle Speed:

BA10AB.AC.50: 2000±100rpm

Throttle Stop Screw

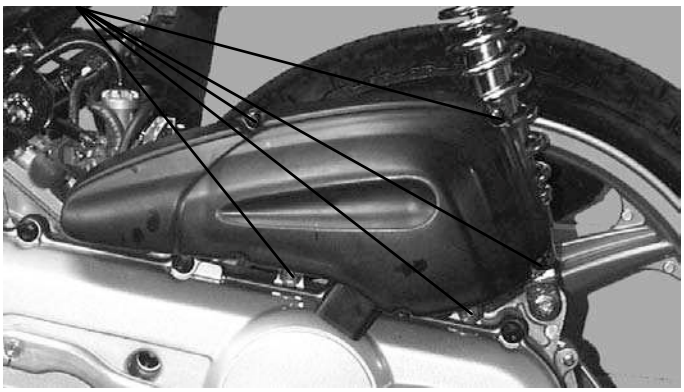


Air Screw

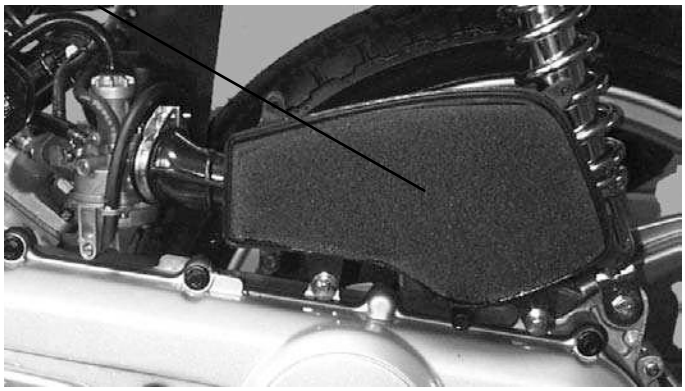
《 Air Cleaner》

Remove the air cleaner cover by removing the five bolts cleaner cover screws.
Remove the air cleaner element.

Screws



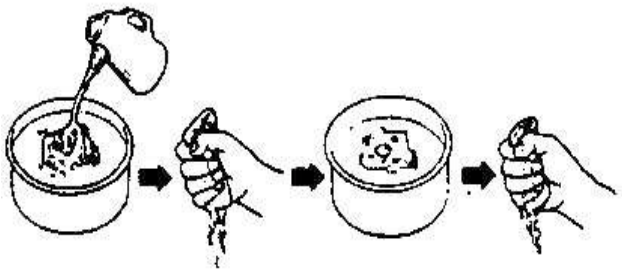
Air Cleaner



Wash the air cleaner element in detergent oil, squeeze out and allow to dry.

* Never use gasoline or organic vaporable oil with acid or alkali for washing.

After washing, soak the element in clean engine oil SAE 15W-40# and squeeze out excess oil. Reinstall the element.



《 Cylinder Compression》

* Warm up the engine before compression test.

Remove the spark plug and insert a compression gauge.
Open the throttle valve fully and push the starter button for 7_ 8 seconds to test the compression.

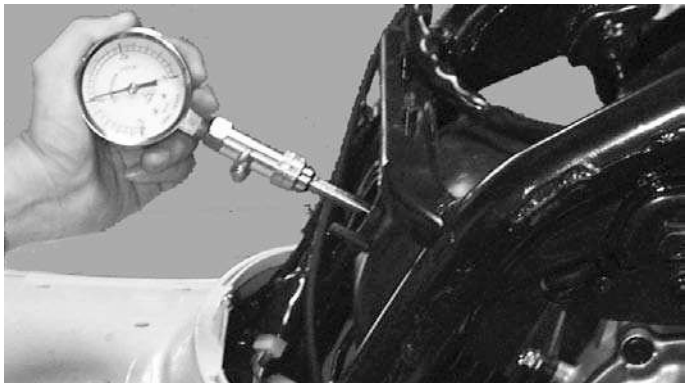
Compression:

BA10AB.AC.50: 11.8kg/cm_

If the compression is low, check for the following:

Leaking cylinder head gasket
Worn piston/cylinder

If the compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and the piston head.

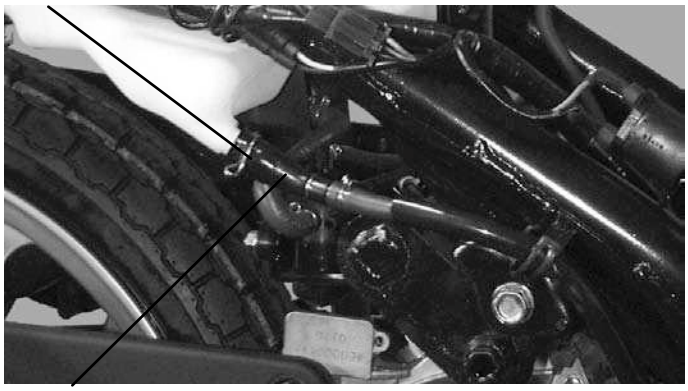


LUBRICATION SYSTEM

《 Oil Filter Cleaning》

Disconnect the oil tube at the oil pump side and allow oil to drain into a clean container.
Remove the tube clip at the oil tank side and disconnect the oil tube.
Remove the oil filter.

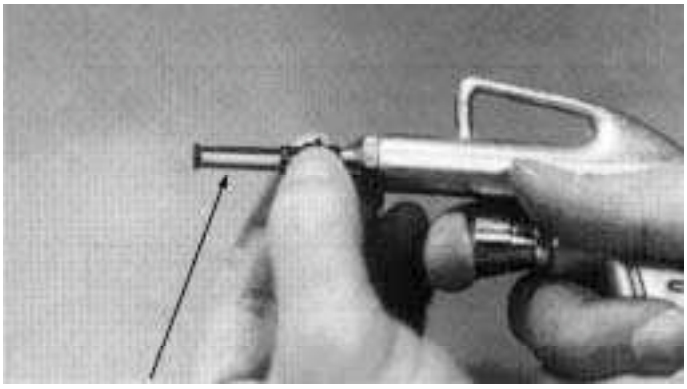
Clip



Oil Filter

Clean the oil filter screen with compressed air.
Install the oil filter in the reverse order of removal and fill the oil tank with specified oil up to the proper level.
Bleed air from the oil pump and oil lines.

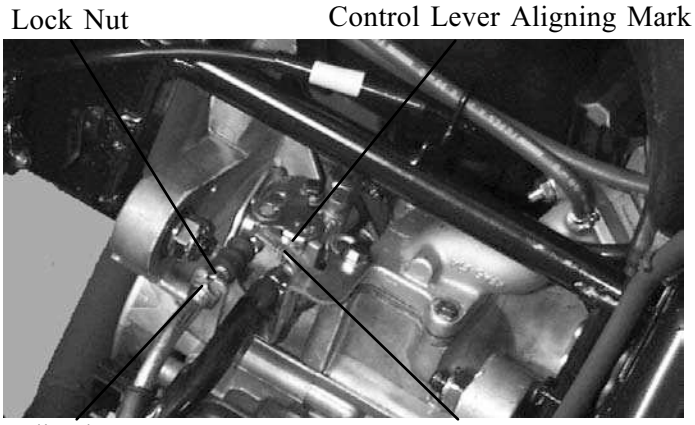
✱
Connect the oil tubes securely.
Install the tube clip at the oil tank side and also install the clip to the lower oil tube that goes to the oil pump.
Check for oil leaks.


Filter Screen

《 Oil Pump Condition》

✱
Adjust oil pump control cable after the throttle grip free play is adjusted.

Open the throttle valve fully and check that the index mark on the pump body aligns with the aligning mark on the oil pump control lever.
Reference tip alignment within 1mm of index mark on open side is acceptable.
Start and idle the engine, then slowly open the throttle to increase engine rpm and check the operation of the oil pump control lever.
If adjustment is necessary, adjust the oil pump control cable by loosening the control cable lock nut and turning the adjusting nut.
After adjustment, tighten the lock nut.



✱
Reference tip alignment within 1mm of index mark on open side is acceptable. However, the aligning mark on the control lever must never be on the closed side of the index mark, otherwise engine damage will occur because of insufficient lubrication.

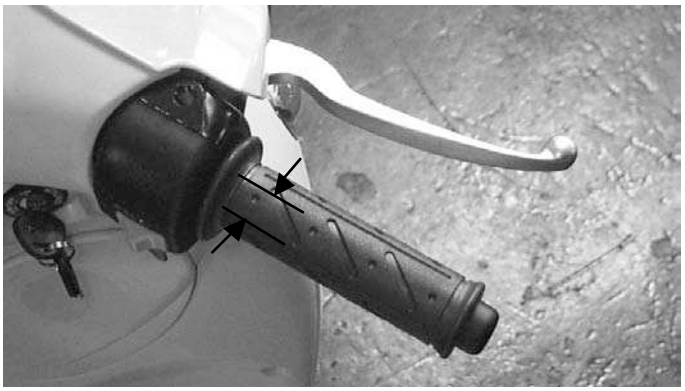
If the oil pump is not synchronized properly, the following will occur:
Excessive white smoke or hard starting due to pump control lever excessively open
Seized piston due to pump control lever insufficiently open

FUEL SYSTEM

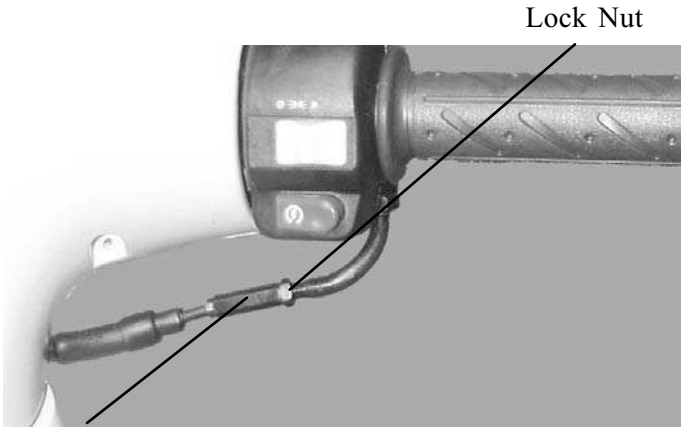
《 Throttle Grip Free Play》

Measure the throttle grip free play.

Free Play: 2_ 6mm



If the throttle grip free play does not fall within the specified range, adjust by loosening the lock nut and turning the adjusting nut.



OTHERS

LIGHTS

《 Headlight》

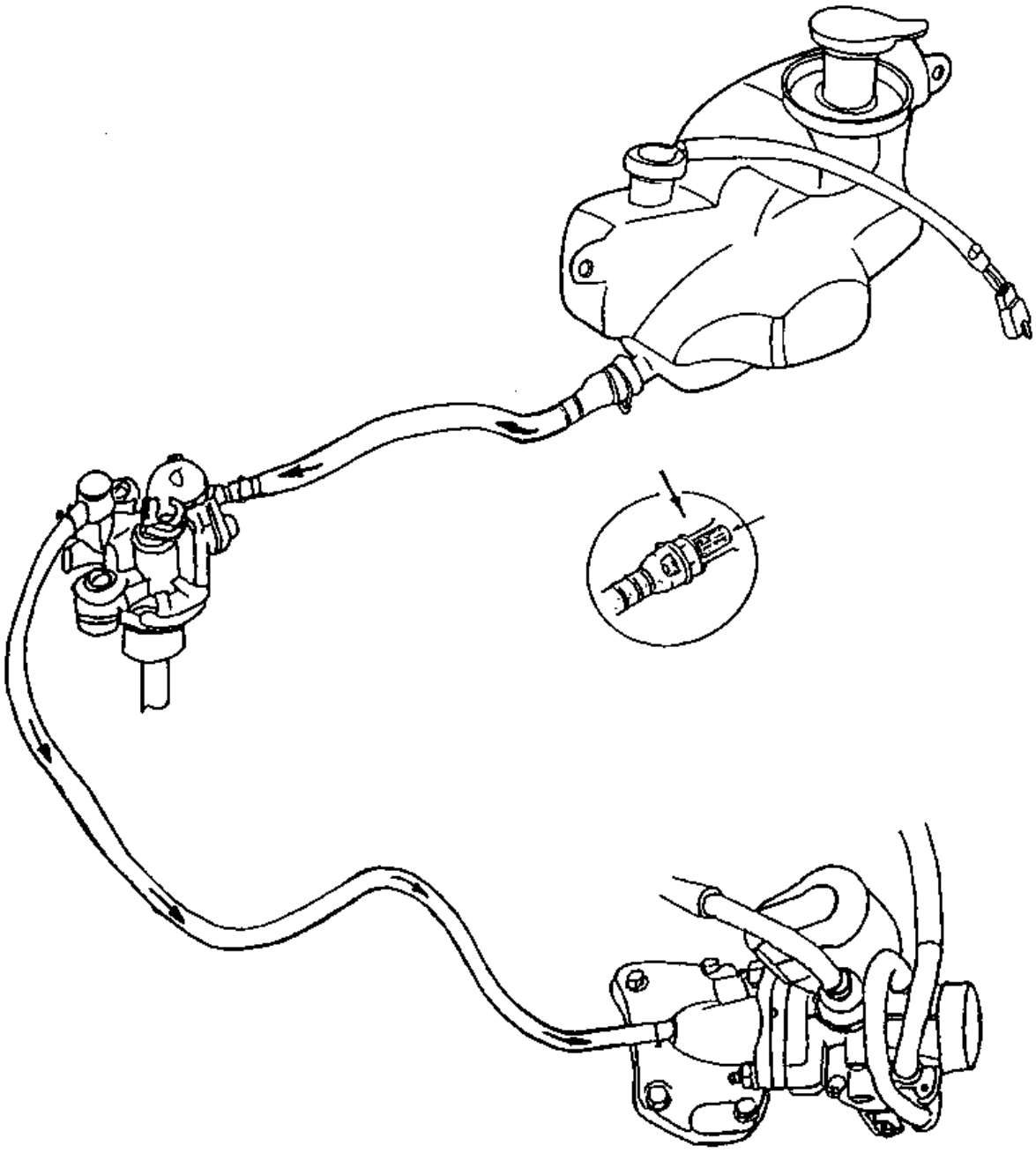
Adjust the headlight beam by loosening the headlight adjusting bolt and moving the adjusting bolt forward and backward to a proper position. Tighten the adjusting bolt.

4

LUBRICATION SYSTEM

SERVICE INFORMATION 4-2
TROUBLESHOOTING 4-2
OIL PUMP REMOVAL 4-3
OIL PUMP INSPECTION 4-3
OIL PUMP INSTALLATION 4-4
OIL PUMP BLEEDING 4-5
OIL TANK 4-6

LUBRICATION SYSTEM



4. LUBRICATION SYSTEM

SERVICE INFORMATION

GENERAL INSTRUCTIONS

Use care when removing and installing the oil pump not to allow dust and dirt to enter the engine and oil line.

Do not attempt to disassemble the oil pump.

Bleed air from the oil pump if there is air between the oil pump and oil line.

If the oil is disconnected, refill the oil line with motor oil before connecting it.

SPECIFICATIONS

Recommended Motor Oil: SAE20W20# 2-stroke Motor Oil

Oil Capacity : 1.1 liter

Light comes on : 0.5 liter

TROUBLESHOOTING

Excessive white smoke or carbon deposits on spark plug

Oil pump not properly synchronized (excessive oil)
Poor quality oil

Engine overheating

Oil pump not properly adjusted (insufficient oiling)

Poor quality oil

Seized piston

No oil in tank or clogged oil line

Oil pump not properly adjusted (insufficient oiling)

Air in oil line

Faulty oil pump

Oil not flowing out of tank to engine

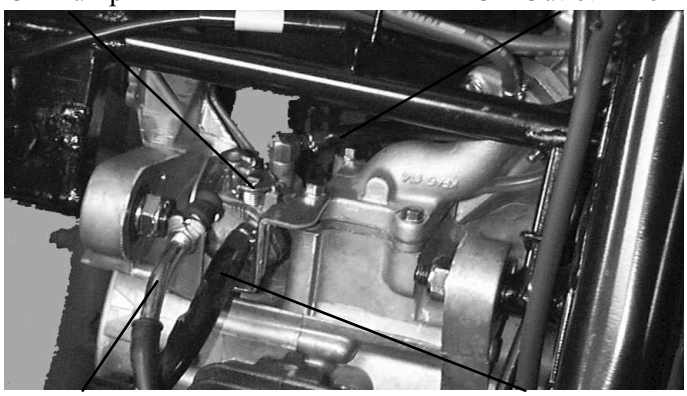
Clogged oil tank cap breather hole

Clogged oil filter

OIL PUMP REMOVAL

✱ Do not allow foreign matters to enter the crankcase. Before removing the oil pump, clean the oil pump and crankcase surfaces.

Remove the met-in box. (⇨12-4)



Disconnect the oil pump control cable from the pump body.
Disconnect the oil inlet line from the oil pump.
Then, disconnect the oil outlet line.

✱ Before disconnecting the oil line, clip the oil line to avoid oil flowing out and then plug the oil line after it is disconnected.

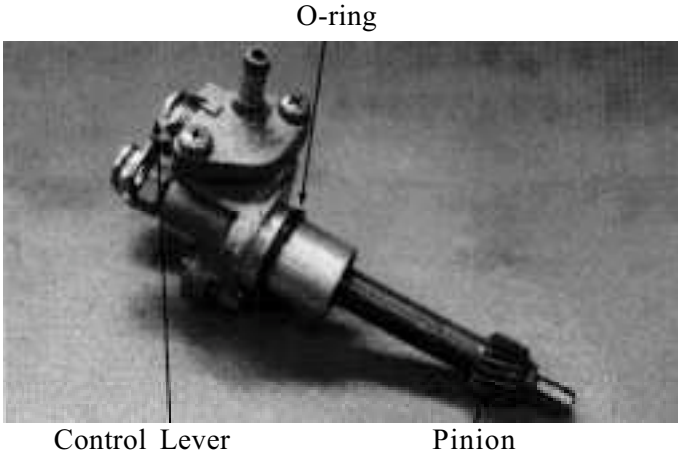
Remove the oil pump control cable plate bolt .
Remove the oil pump from the crankcase.

OIL PUMP INSPECTION

Remove the oil pump and inspect the following items:

- Weakened O-ring
- Damage to crankcase mating surface
- Damage to pump body
- Control lever operation
- Oil leaks through oil seals
- Worn or damaged pump pinion

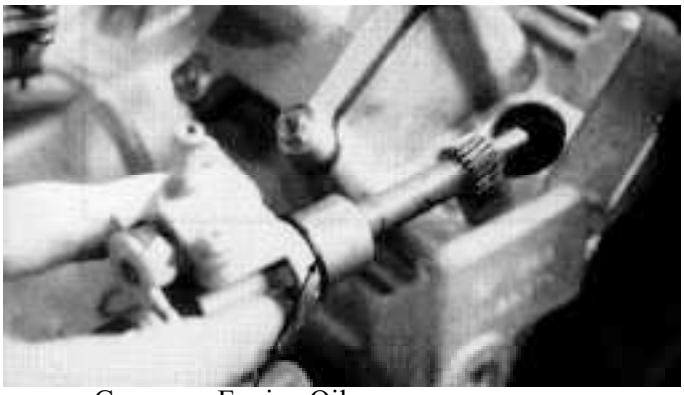
✱ Do not disassemble the oil pump which cannot be used after disassembly.



OIL PUMP INSTALLATION

✱

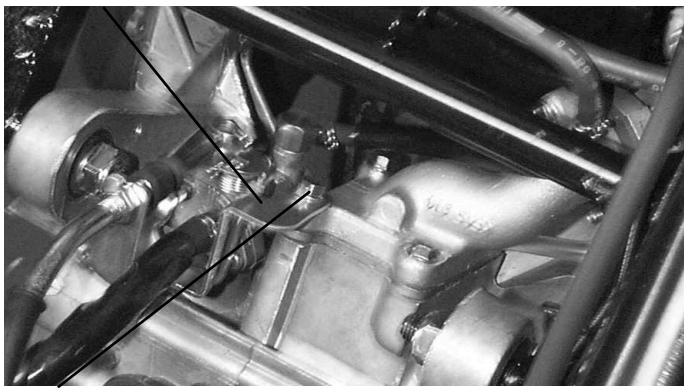
Lubricate the O-ring with grease or engine oil before installation.
Make sure that the oil pump is inserted into the crankcase.
Apply molybdenum disulfide or grease to the pump pinion.



Grease or Engine Oil

Install the oil pump onto the crankcase.

Control Cable Plate



Bolt

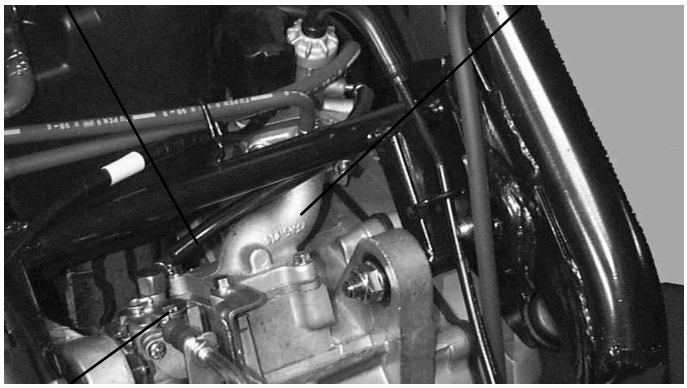
Install the oil pump control cable plate.
Connect the oil inlet line and oil outlet line properly.
Connect the oil pump control cable.
Bleed air from the oil pump.

Oil Outlet Line

Control Cable

OIL PUMP BLEEDING

✱ Air in the oil lines will block oil flow and result in severe engine damage. Bleed air from the oil lines and oil pump whenever the oil lines or pump have been removed or there is air in the oil lines.



OIL INLET LINE/OIL PUMP BLEEDING

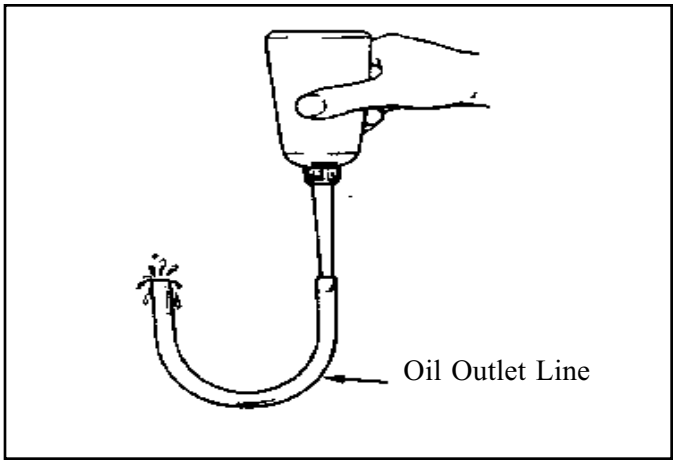
Fill the oil tank with recommended oil.
Place a shop towel around the oil pump.
Disconnect the oil inlet line from the oil pump and clip it.
Fill the oil pump with oil by squirting clean oil through the joint. (About 3cc)
Fill the oil line with oil and connect it to the oil pump.

✱ Bleed air from the oil inlet line first, then bleed air from the oil outlet line.

OIL OUTLET LINE BLEEDING

1. Disconnect the oil outlet line and bend it into U shape. Force air out of the tube by filling it with oil.
2. Start the engine and allow it to idle with the oil control lever in the fully open position. Visually check the oil flow.
3. If there is no oil flowing out within 1 minute, bleed air from the oil inlet line and oil pump.

✱ Never run the engine in a closed area. Do not increase the engine speed at will.



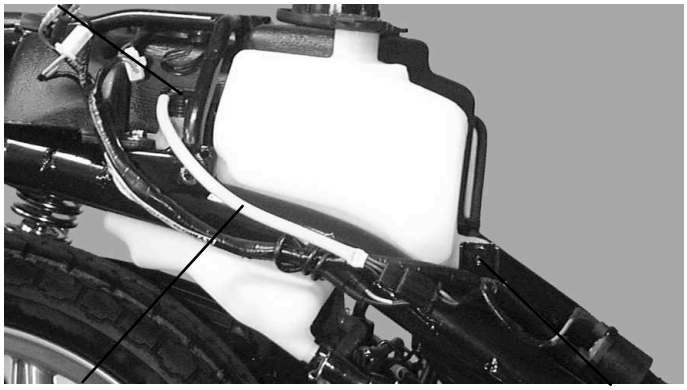
Oil Tube

OIL TANK

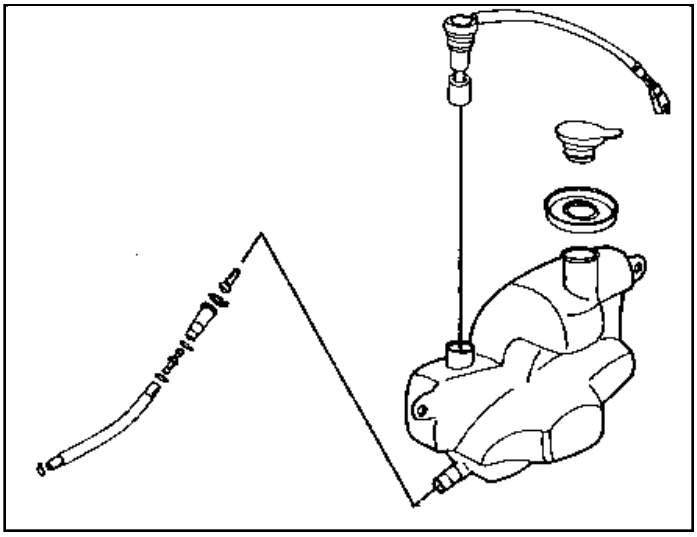
OIL TANK REMOVAL

Remove the met-in box. (⇨12-5)
Remove the frame body cover. (⇨12-5)
Remove the rear carrier. (⇨12-5)
Remove the two bolts, four nuts attaching the stay comp fuel tank.
Remove the oil meter connector.
Remove the two bolts attaching the oil tank.
Disconnect the oil inlet line.
Drain the oil inside the oil tank into a clean container.
Remove the oil tank.
The installation sequence is the reverse of removal.

Oil Meter



Wire Connector Bolts



* Connect the oil line properly.
Bleed air from the oil pump after installation.
The oil tube clip (at the oil tank side) must be locked from inside of the oil tube joint.

5

ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION..... 5-1
ENGINE REMOVAL..... 5-2
ENGINE INSTALLATION..... 5-4

5. ENGINE REMOVAL/INSTALLATION

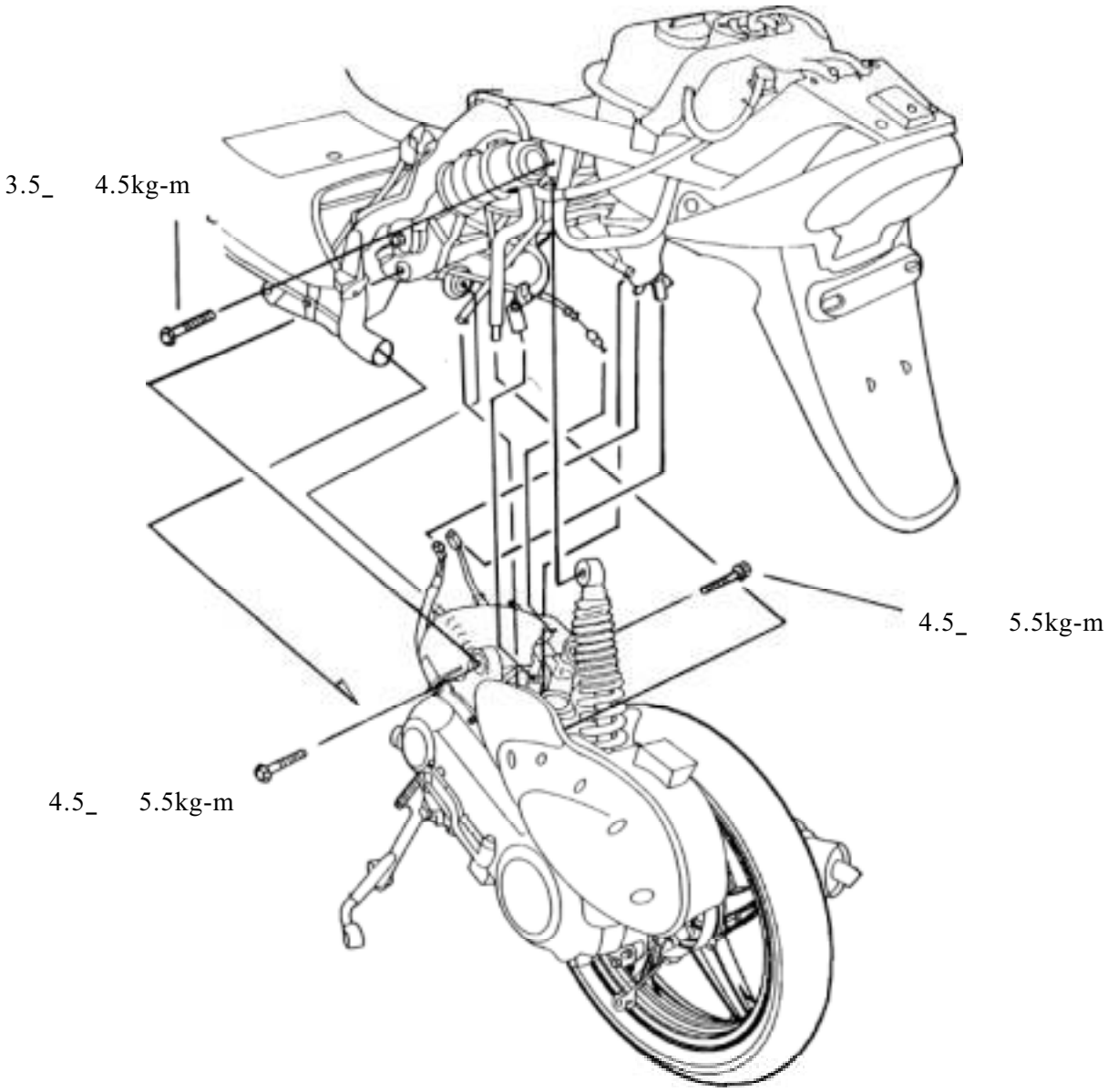
SERVICE INFORMATION

GENERAL INSTRUCTIONS

Parts requiring engine removal for servicing:
Crankcase
Crankshaft

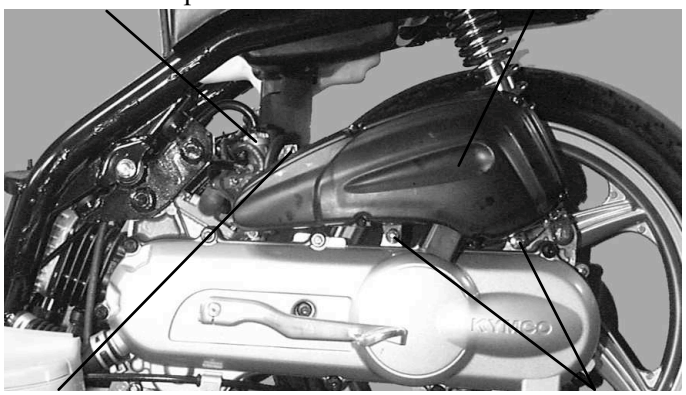
TORQUE VALUES

Engine mounting bolt	4.5_	5.5kg-m
Rear shock absorber lower mount bolt	2.4_	3.0kg-m
Engine hanger bracket bolt	3.5_	4.5kg-m



ENGINE REMOVAL

Remove the frame body cover. (⇨12-5)
Remove the two bolts attaching the air cleaner case.
Loosen the band between the air cleaner and carburetor to remove the air cleaner case.
Remove the carburetor cap.

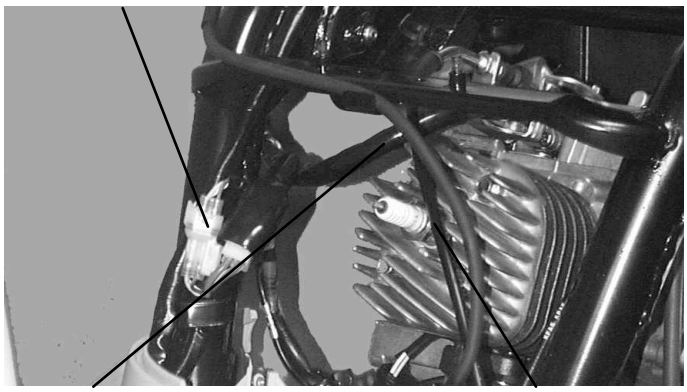


Disconnect the oil pump control cable from the pump body.
Disconnect the oil inlet line from the oil pump.

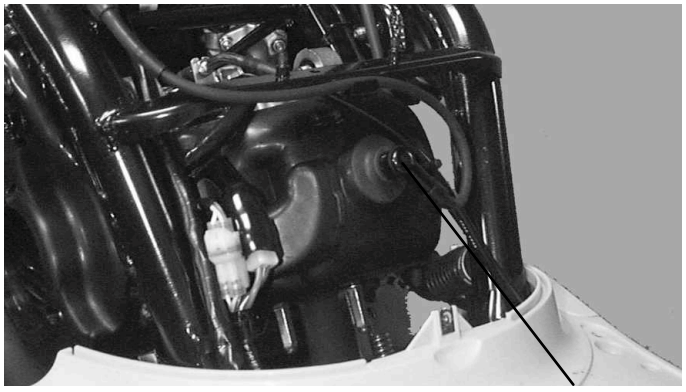
✱

After the oil inlet line is disconnected, plug the oil line opening to prevent oil from flowing out.

Disconnect the auto bystarter, A.C. generator and starter motor wire connectors.

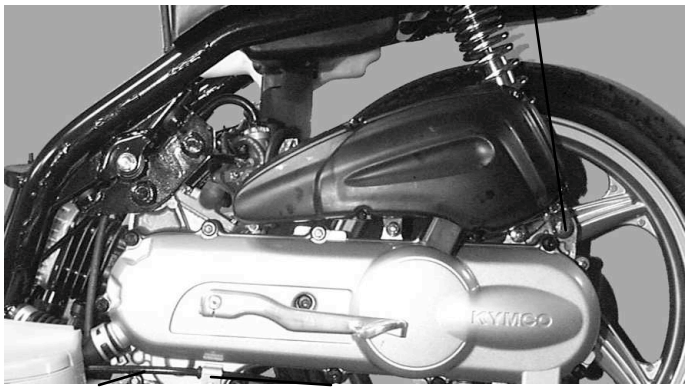


Remove the spark plug cap.



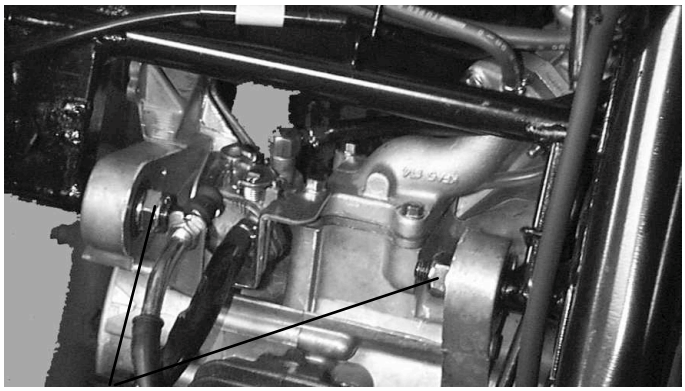
Remove the rear brake adjusting nut and disconnect the brake cable from the crankcase.
Remove the rear brake cable clamp and rear brake cable.
Remove the cooling air tube band on the left crankcase cover and disconnect the cooling air tube.
Remove the rear shock absorber lower mount bolt.

Rear Shock Absorber Lower Mount Bolt



Rear Brake Cable Clamp

Remove the right and left engine mounting nuts.
Take out the right and left engine mounting bolts.
Lift the frame upward to separate it from the engine and be careful not to damage the rear fender.



Engine Mounting Nuts

ENGINE HANGER BRACKET REMOVAL

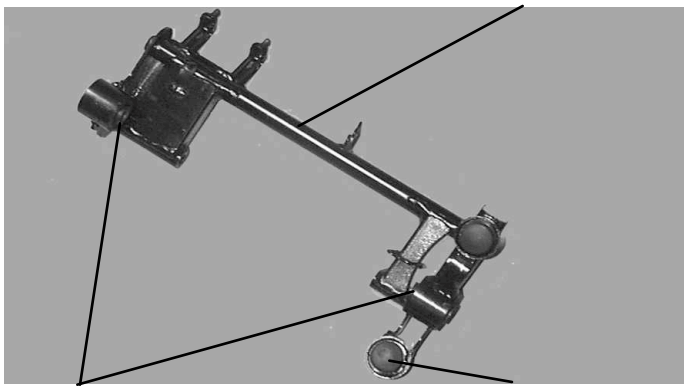
Remove the engine hanger bracket bolt and engine hanger bracket.
The installation sequence is the reserve of removal.
Torque: 3.5_ 4.5kg-m

Engine Hanger Bracket

Engine Hanger Bracket Bolt

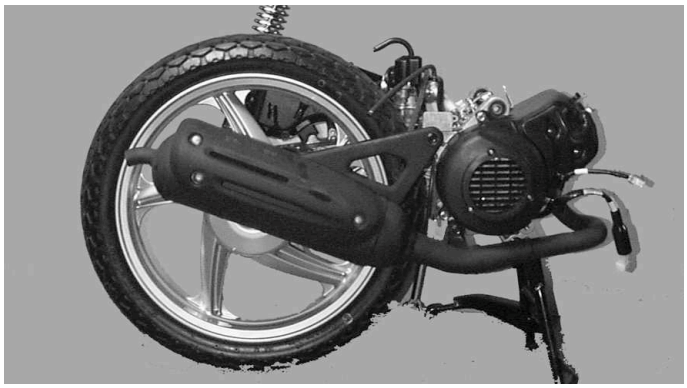
ENGINE HANGER BRACKET INSPECTION

Inspect the stopper rubbers and bushings for damage and replace with new ones if necessary.



ENGINE INSTALLATION

Install the engine in the reverse order of removal.



✱ Cables and wires should be routed properly.

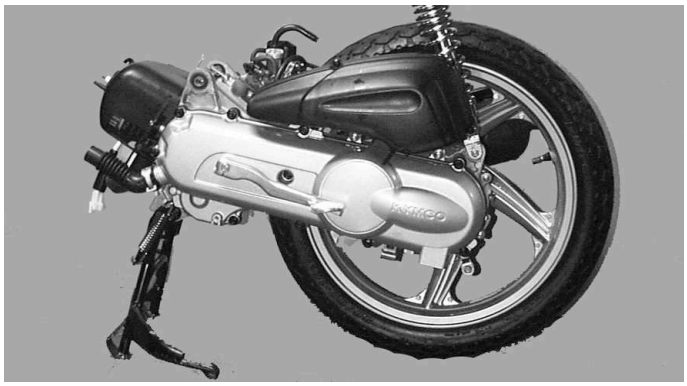
Torque Values:

Engine mounting bolt : 4.5_ 5.5kg-m

Rear shock absorber lower mount bolt: : 2.4_ 3.0kg-m

Perform the following inspections and adjustments after installation.

- Throttle cable
- Oil pump control cable (⇨3-11)
- Rear brake cable (⇨3-5)
- Oil pump bleeding (⇨3-11)



6

CYLINDER HEAD/CYLINDER/PISTON

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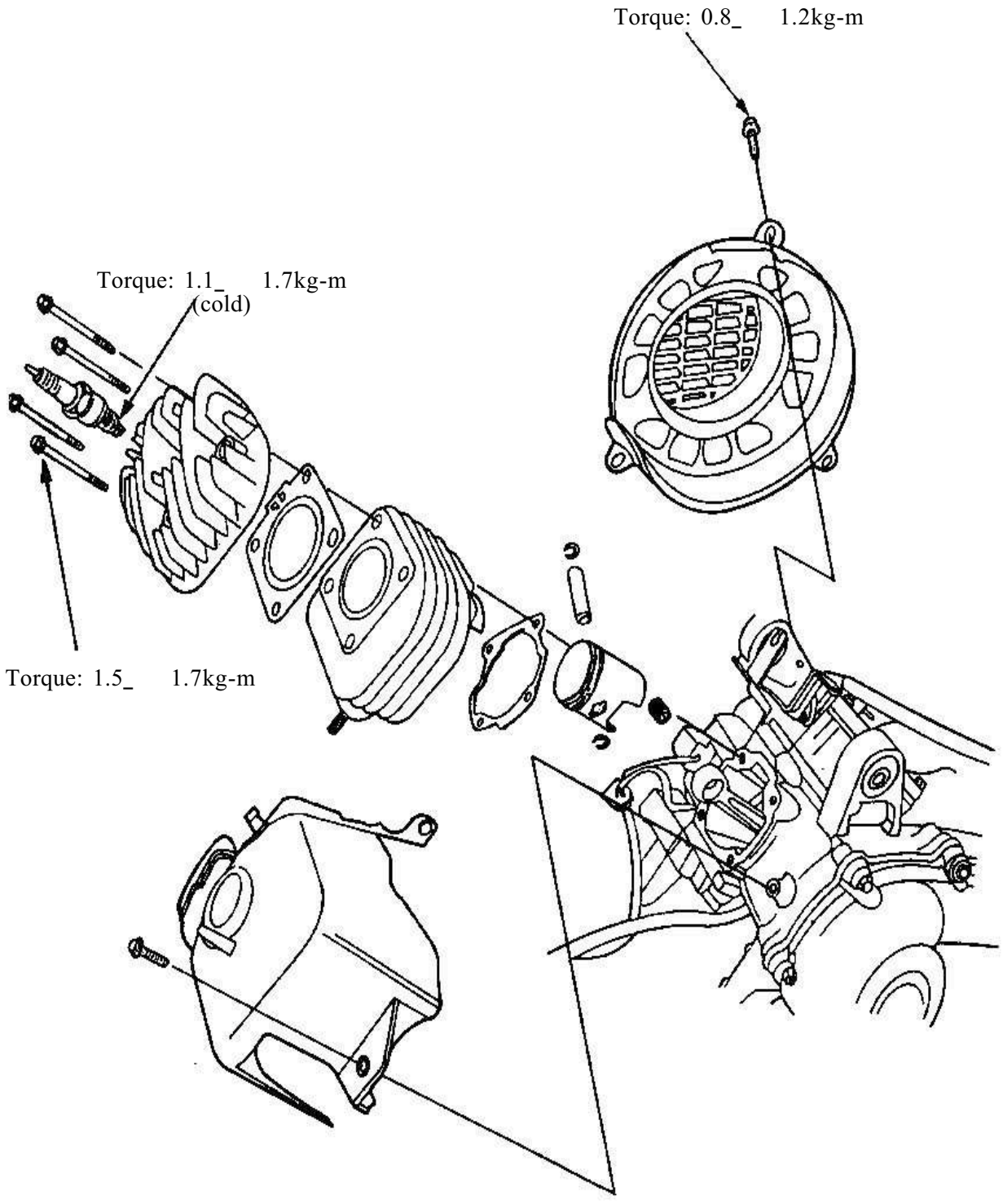
TROUBLESHOOTING 6-2
CYLINDER HEAD 6-3
CYLINDER/PISTON 6-6

6. CYLINDER HEAD/CYLINDER/PISTON



6. CYLINDER HEAD/CYLINDER/PISTON

SERVICE INFORMATION

GENERAL INSTRUCTIONS

The cylinder head, cylinder and piston can be serviced with the engine installed in the frame.
Before disassembly, clean the engine to prevent dust from entering the engine.
Remove all gasket material from the mating surfaces.
Do not use a driver to pry between the cylinder and cylinder head, cylinder and crankcase.
Do not damage the cylinder inside and the piston surface.
After disassembly, clean the removed parts before inspection. When assembling, apply the specified engine oil to movable parts.

SPECIFICATIONS	Standard (mm)	Service Limit (mm)
Item	BA10AB.AC.50	BA10AB.AC 50
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston	38.970_ 38.955	38.90
Cylinder-to- piston clearance		0.10
Piston pin hole I.D.	12.002_ 12.008	12.03
Piston pin O.D.	11.994_ 12.0	11.98
Piston-to-piston pin clearance	←	←
Piston ring end gap (top/second)	0.10_ 0.25	0.40
Connecting rod small end I.D.	17.005_ 17.017	17.03
Cylinder bore	39.0_ 39.025	39.05

TORQUE VALUES

Cylinder head bolt	1.5_	1.7kg-m
Exhaust muffler joint lock nut	1.0_	1.4kg-m
Exhaust muffler lock bolt	3.0_	3.6kg-m
Spark plug	1.1_	1.7kg-m

● TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

Leaking cylinder head gasket
Loose spark plug
Worn, stuck or broken piston and piston rings
Worn or damaged cylinder and piston

Compression too high, overheating or knocking

Excessive carbon build-up in cylinder head or on piston head

Abnormal noisy piston

Worn cylinder and piston
Worn piston pin or piston pin hole
Worn connecting rod small end bearing

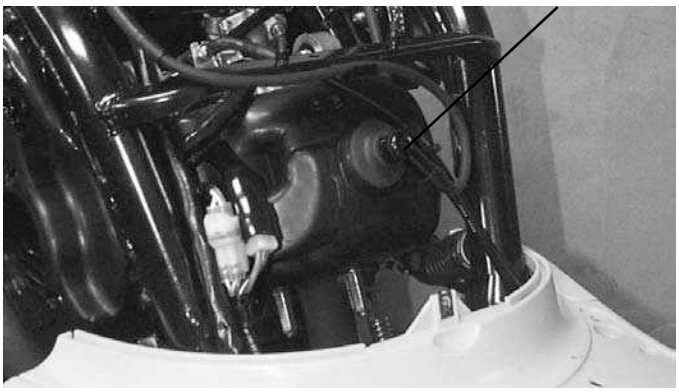
Abnormal noisy piston rings

Worn, stuck or broken piston rings
Worn or damaged cylinder

CYLINDER HEAD

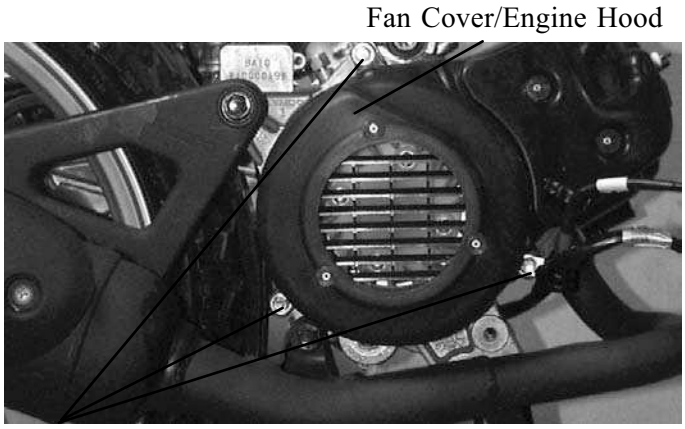
REMOVAL

Remove the rear carrier.
Remove the frame body cover. (⇨12-5)



Remove the spark plug cap.
Remove the three bolts attaching the fan cover to remove the fan cover.
Remove the two joint lock nuts on the front of the exhaust muffler and then remove the two exhaust muffler lock bolts.
Remove the bolt attaching the engine hood to remove the engine hood.
The installation sequence is the reverse of removal.

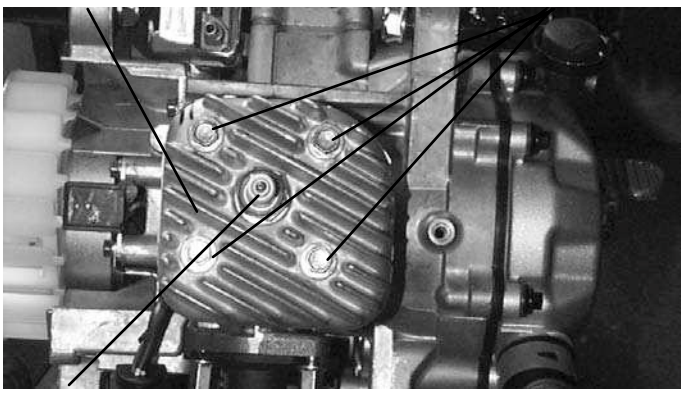
✱ When installing the exhaust muffler, first tighten the two nuts on the front and then tighten the two bolts.



Remove the spark plug.
Remove the cylinder head bolts and the cylinder head.

✱ Loosen the bolts diagonally in 2 or 3 times.

Remove the cylinder head gasket.

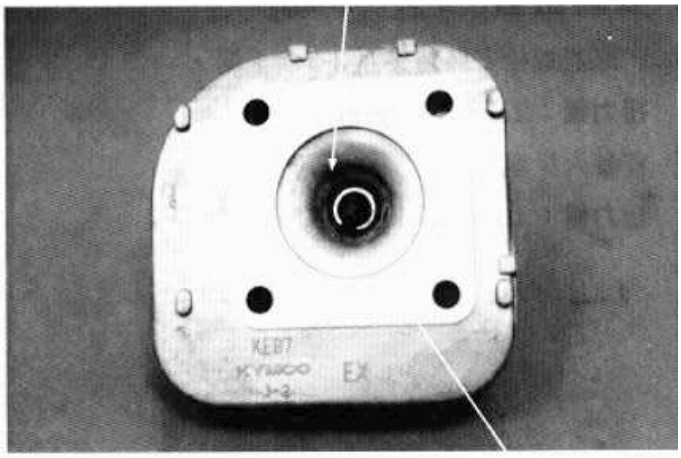


COMBUSTION CHAMBER DECABONIZING

Remove the carbon deposits from the combustion chamber

✱ Avoid damaging the combustion chamber wall and cylinder mating surface.

Combustion Chamber



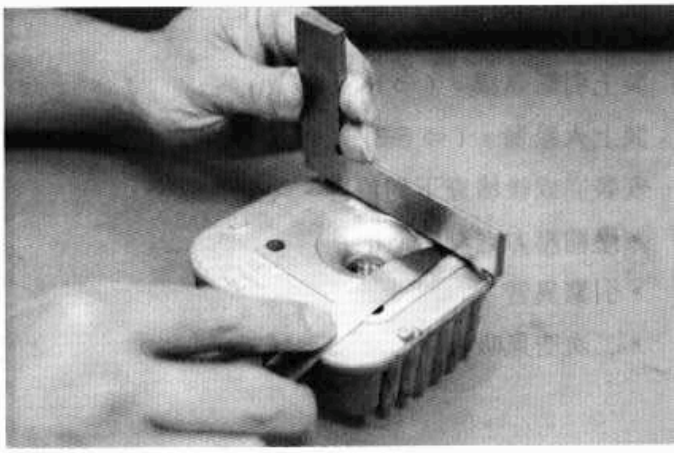
Mating Surface

CYLINDER HEAD INSPECTION

Check the cylinder head for warpage with a straight edge and feeler gauge.

Service Limit:

BA10AB.AC.50: 0.10mm replace if over



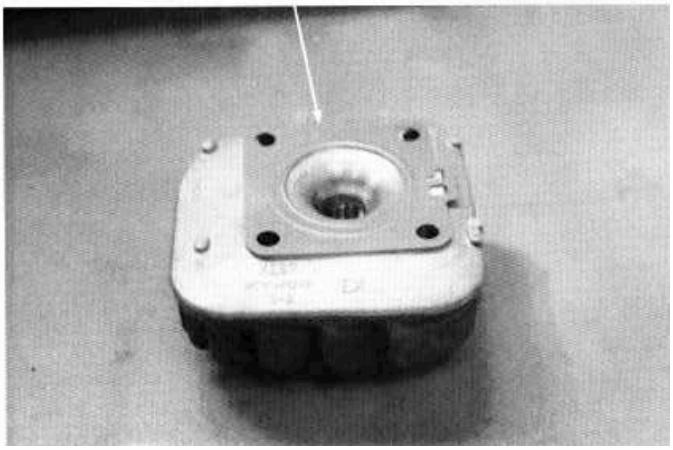
CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder properly.

✱ Be careful not to damage the mating surfaces.

Install a new cylinder head gasket onto the cylinder.

Cylinder head Gasket



Cylinder Head Bolts Installation

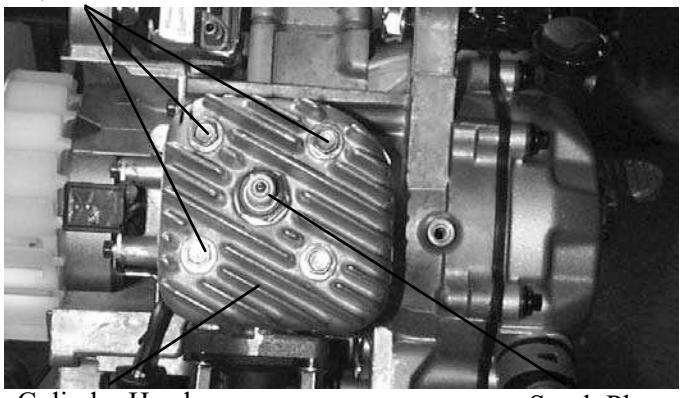
Install and tighten the cylinder head bolts diagonally in 2 or 3 times.

Torque: 1.5_ 1.7kg-m

Install the spark plug.

Torque: 1.1_ 1.7kg-m

Cylinder head Bolts



Cylinder Head

Spark Plug

Engine Hood Installation

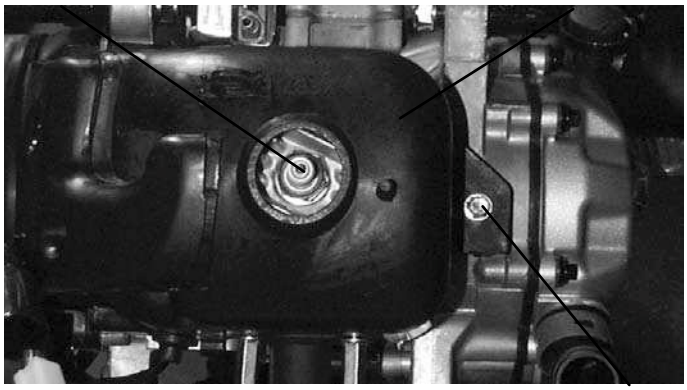
Install the engine hood. (⇨6-3)
Install the spark plug cap. (⇨6-3)

Perform the following inspections after installation:

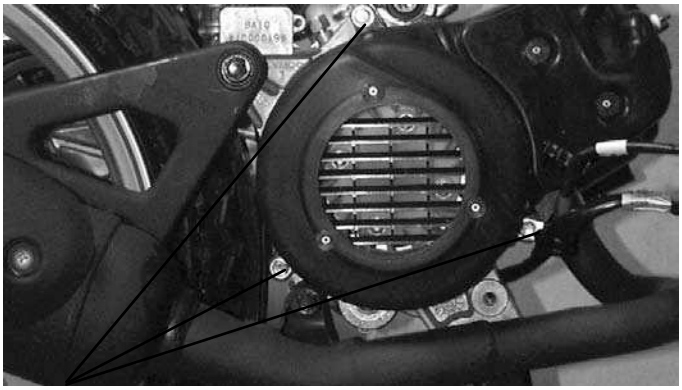
- Compression test
- Abnormal engine noise
- Cylinder air leaks

Spark Plug

Engine Hood



Bolt



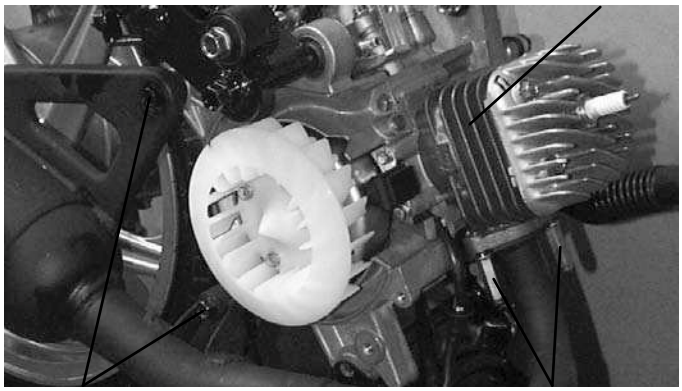
Bolts

CYLINDER/PISTON

CYLINDER REMOVAL

Remove the met-in box and seat.
Remove the frame body cover.
Remove the cylinder head.
Remove the two exhaust muffler joint lock nuts and two exhaust muffler lock bolts.
Remove the exhaust muffler.
Remove the cylinder.
Remove the cylinder gasket.

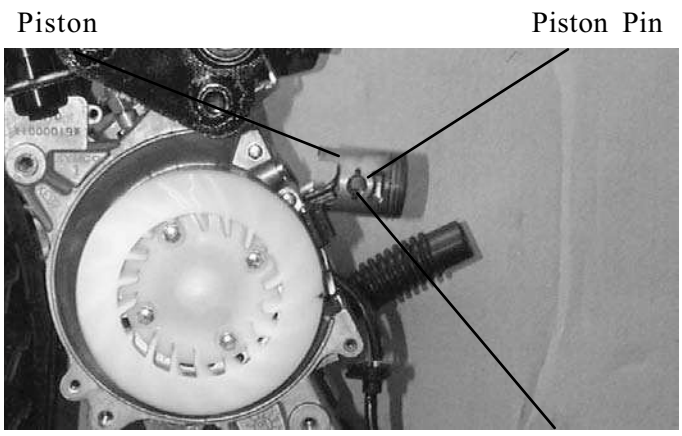
✱ Do not pry between the cylinder and crankcase or strike the fins.



PISTON REMOVAL

Remove the piston pin clip to remove the piston pin and piston.

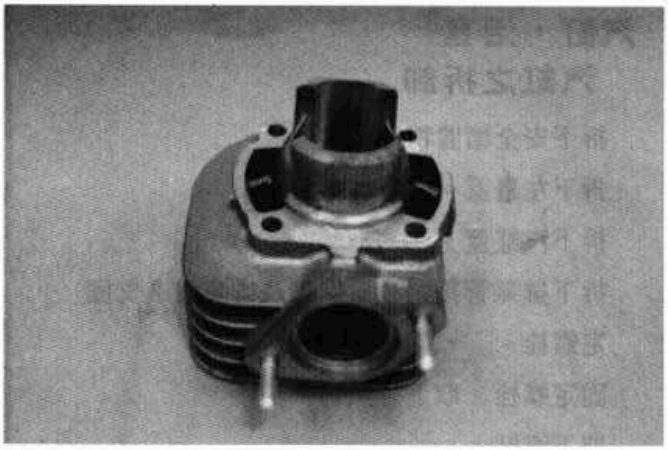
✱ Do not damage or scratch the piston.
Do not apply side force to the connect-ing rod when removing the piston pin.
Place clean shop towels in the crank-case to keep the piston pin clip from falling into the crankcase.



Spread each piston ring and remove by lifting it up at a point just opposite the gap.
Remove the expander.

CYLINDER/PISTON INSPECTION

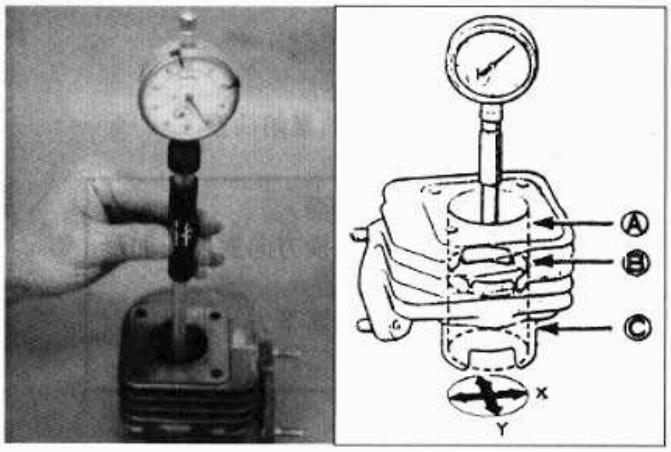
Check the cylinder and piston for wear or damage.
Clean carbon deposits from the exhaust port area.



✱ Be careful not to damage the cylinder inside wall.

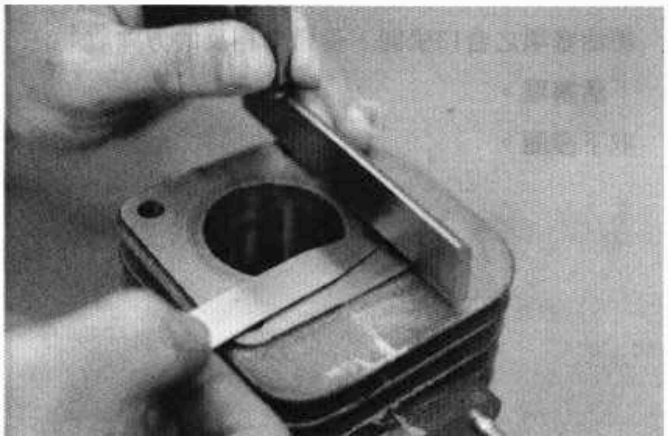
Measure the cylinder bore at three levels of A, B and C in both X and Y directions. Avoid the port area. Take the maximum figure measured to determine the cylinder bore.

Service Limit:
BA10AB.AC.50: 39.05mm replace if over



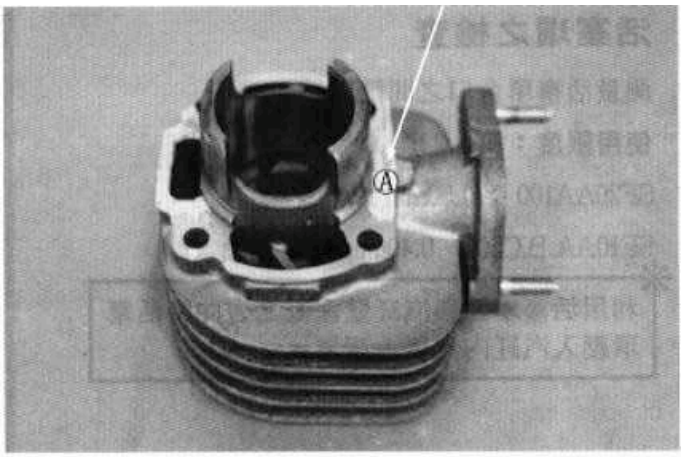
Inspect the top of the cylinder for warpage.

Service Limit:
BA10AB.AC.50: 0.10mm replace if over

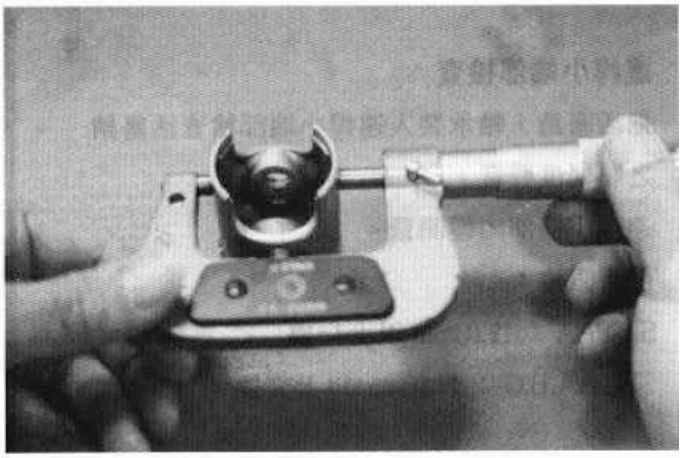


✱ The cylinder has an A mark or no mark on it. When replacing the cylinder with a new one, use a cylinder having the same mark as the old one.

A Mark



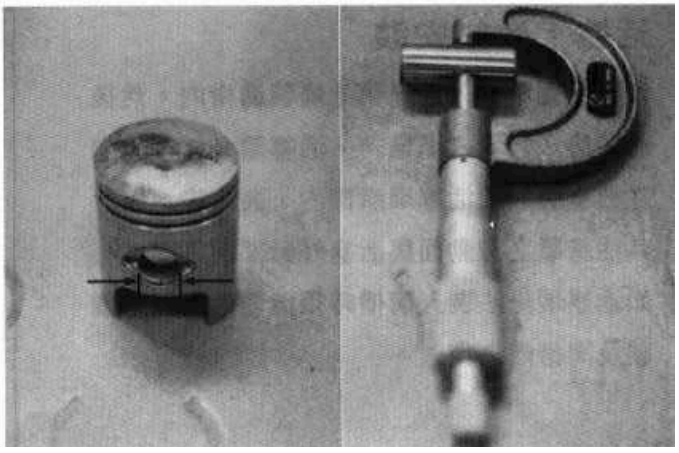
Measure the piston O.D. at a point 5mm from the bottom of the piston skirt.
Service Limit:
BA10AB.AC.50: 38.90mm replace if below



Measure the piston-to-cylinder clearance.
Service Limit:
BA10AB.AC.50: 0.10mm replace if over

Measure the piston pin hole I.D.
Service Limit:
BA10AB.AC.50: 12.03mm replace if over

Measure the piston pin O.D.
Service Limit:
BA10AB.AC.50: 11.98mm replace if below



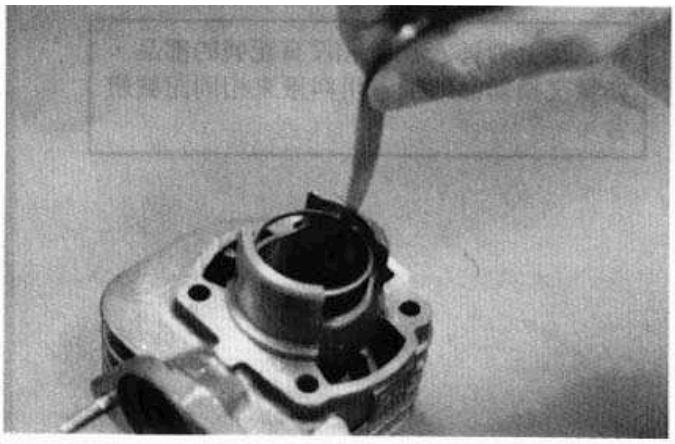
Measure the piston-to-piston pin clearance.
Service Limit:
BA10AB.AC.50: 0.03mm replace if over

PISTON RING INSPECTION

Measure each piston ring end gap.

Service Limits: Top/Second

BA10AB.AC.50: 0.40mm replace if over



✱ Set each piston ring squarely into the cylinder using the piston and measure the end gap.

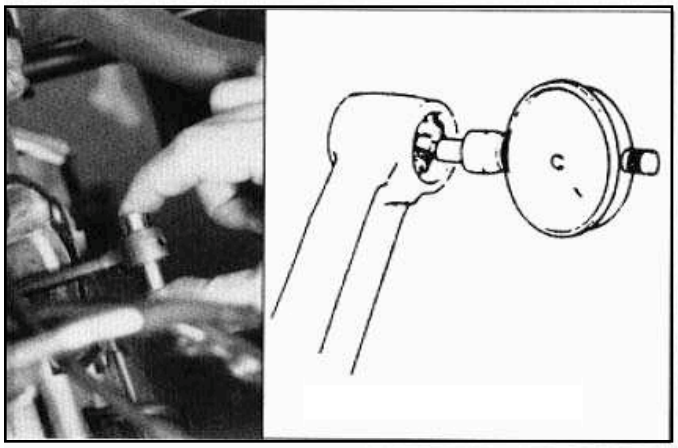
CONNECTING ROD SMALL END INSPECTION

Install the piston pin and bearing in the connecting rod small end and check for excessive play.

Measure the connecting road small end I.D.

Service Limit:

BA10AB.AC.50: 17.03mm replace if over



PISTON/CYLINDER INSTALLATION

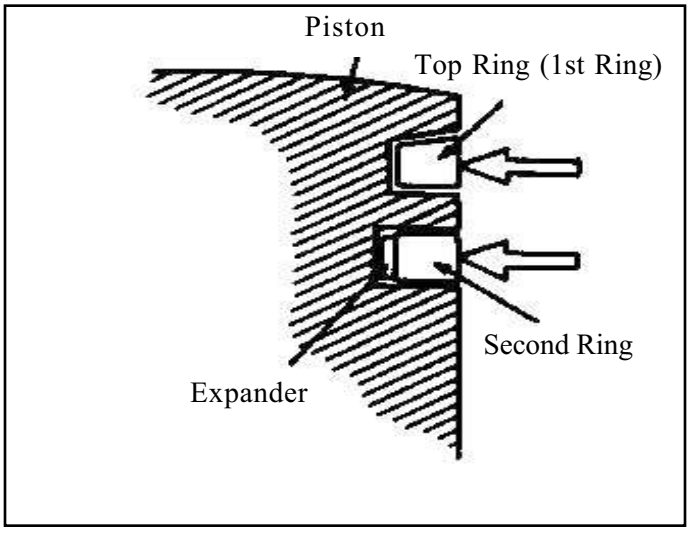
First install the expander in the second ring groove.

Then install the top and second rings in their respective ring grooves.

The piston rings should be pressed into the grooves with even force.

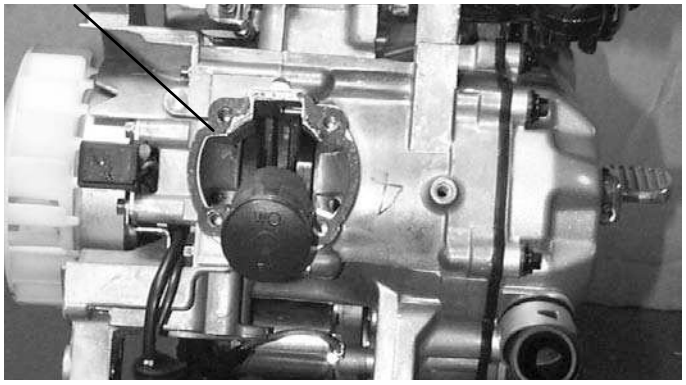
After installation, check and make sure that each ring is flush with the piston at several points around the ring.

A ring that will not compress means that the ring groove has carbon deposits in it and should be cleaned.



Install a new cylinder gasket on the mating surface between the cylinder and crankcase.

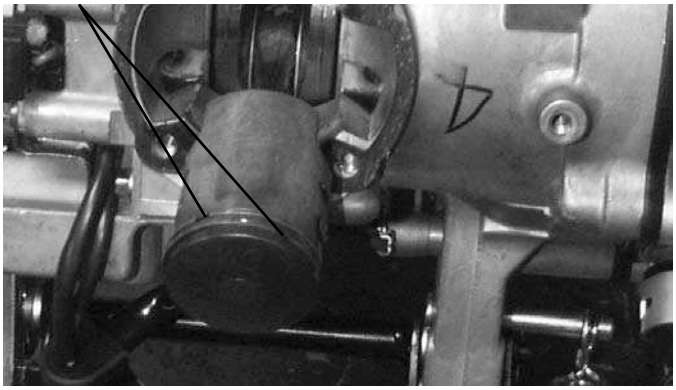
Cylinder Gasket



Make sure that the ring end gaps are aligned with the piston ring pins in the ring grooves.

Lubricate the cylinder inside and piston rings with engine oil and install the piston into the cylinder while compressing the piston rings.

Ring Pins



✱ Be careful not to damage the piston.

Install the cylinder head.

Torque: 1.5_ 1.7kg-m

Install the exhaust muffler and tighten the exhaust muffler joint lock nuts.

Torque: 1.0_ 1.4kg-m

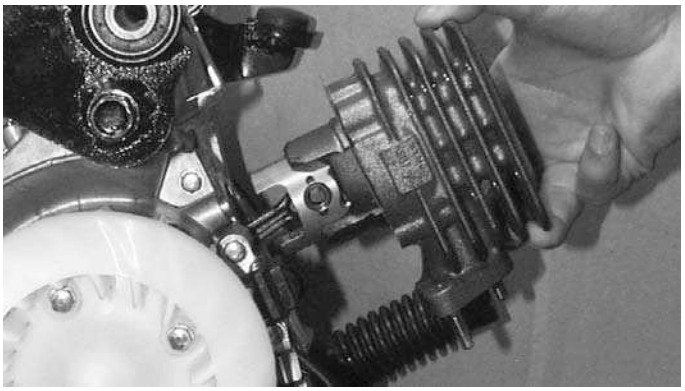
Tighten the exhaust muffler lock bolts.

Torque: 3.0_ 3.6kg-m

Install the frame covers.

Install the met-in box.

The installation sequence is the reverse of removal .



7

A.C. GENERATOR

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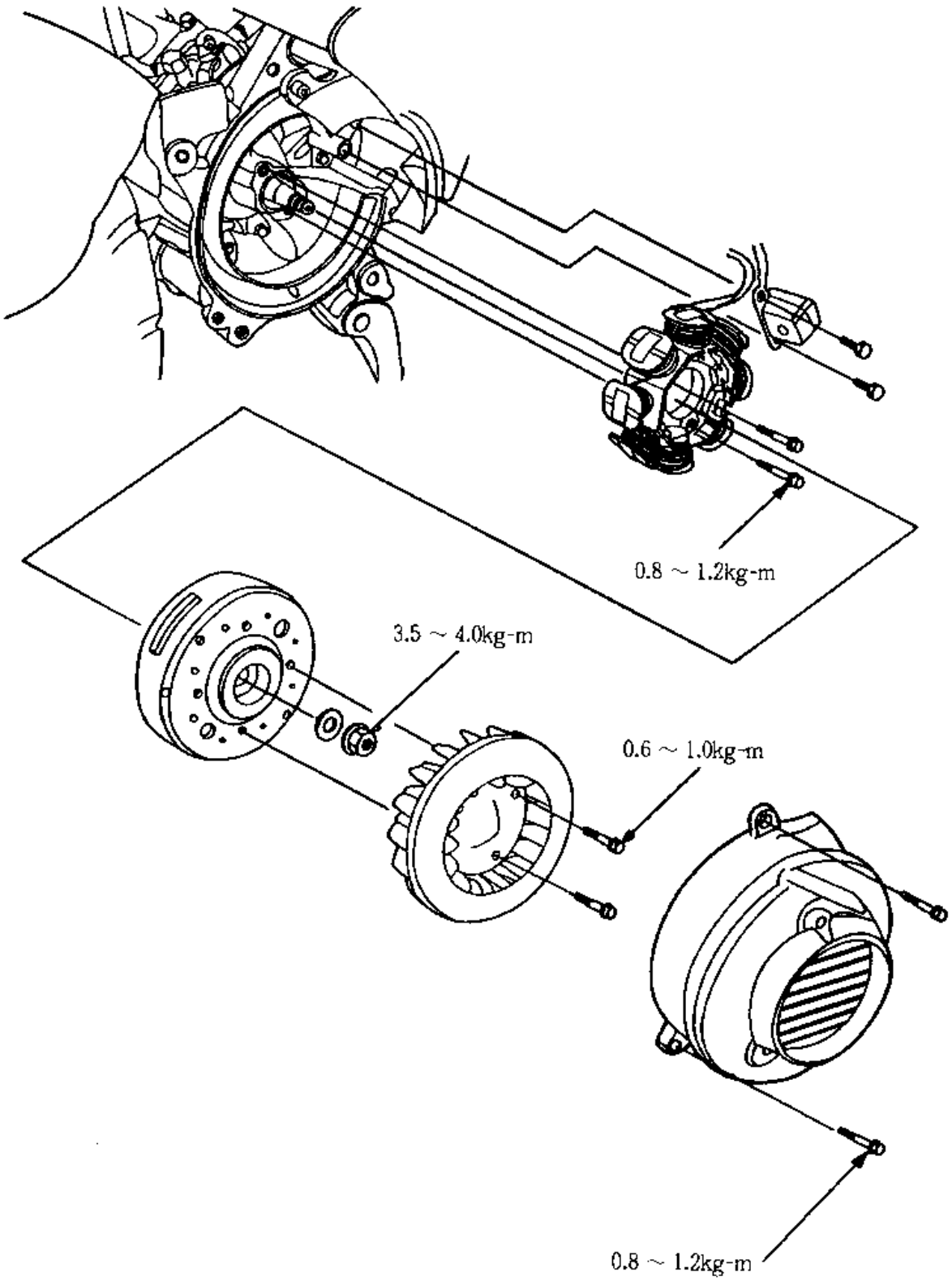
A.C. GENERATOR REMOVAL 7-3
A.C. GENERATOR INSTALLATION 7-4


0.8 ~ 1.2kg-m
3.5 ~ 4.0kg-m
0.6 ~ 1.0kg-m
0.8 ~ 1.2kg-m

7. A.C. GENERATOR

SERVICE INFORMATION

GENERAL INSTRUCTIONS

All A.C. generator maintenance and inspection can be made with the engine installed.
Refer to Section 15 for A.C. generator inspection.

TORQUE VALUE

Flywheel nut : 3.5_ 4.0kg-m

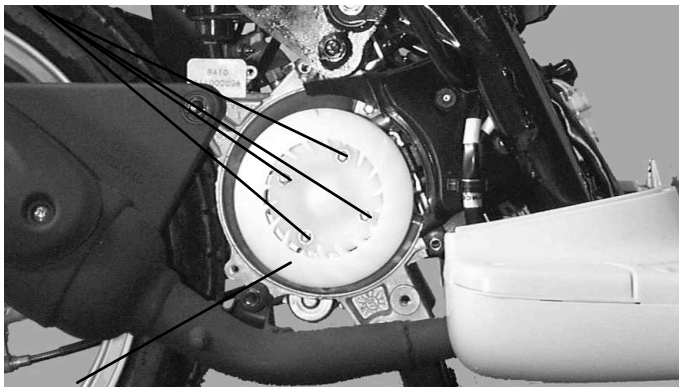
SPECIAL TOOLS

Flywheel puller
Universal holder

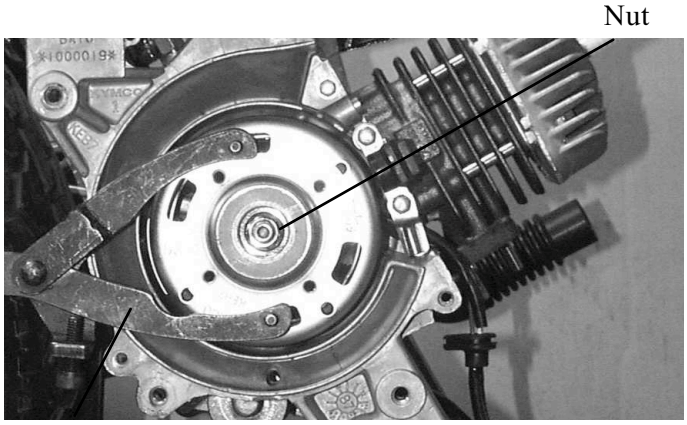
A.C. GENERATOR REMOVAL

Remove the three bolts attaching the fan cover to remove the fan cover.

Remove the cooling fan by removing the four bolts.

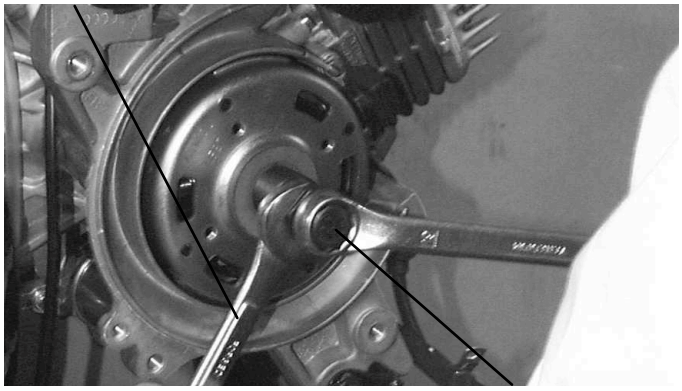


Hold the flywheel with an universal holder and then remove the 10mm flywheel nut.



Remove the A.C. generator flywheel using the flywheel puller.

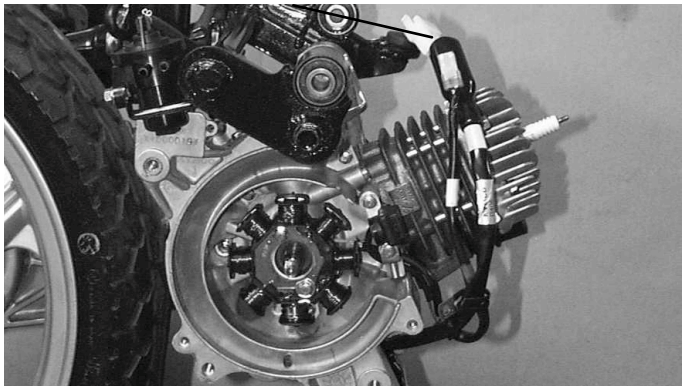
Lock Nut Wrench



Flywheel Puller

Remove the A.C. generator wire connector.

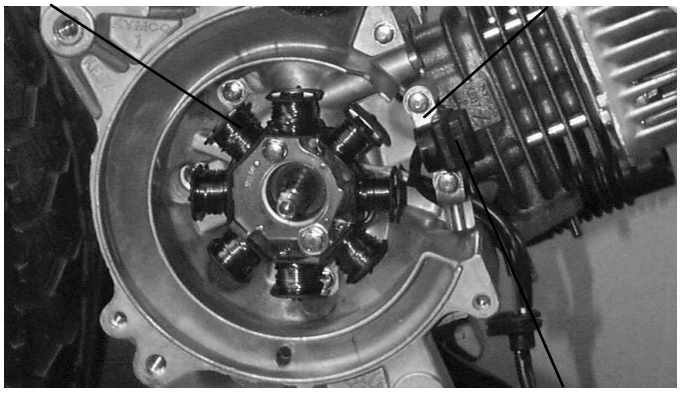
A.C. Generator Wire Connector



Remove the two pulser coil bolts and pulser coil from the right crankcase.
Remove the pulser coil wire clamp from the right crankcase.
Remove the two bolts attaching the A.C. generator stator.

Stator

Wire Clamp



Pulser Coil

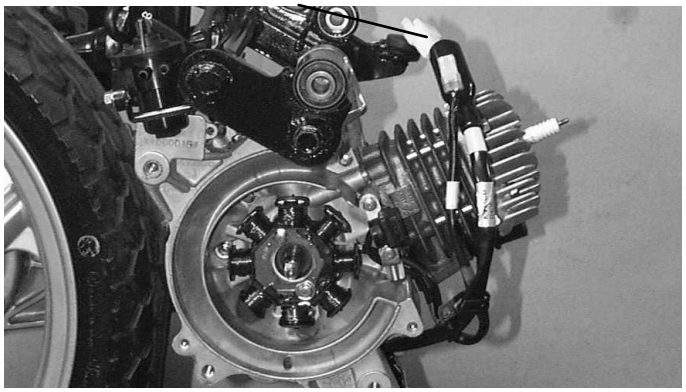
✱ Be careful not to damage the disconnected wire.

A.C. GENERATOR INSTALLATION

Install the A.C. generator stator and pulser coil wire clamp onto the right crankcase, and then install the pulser coil.

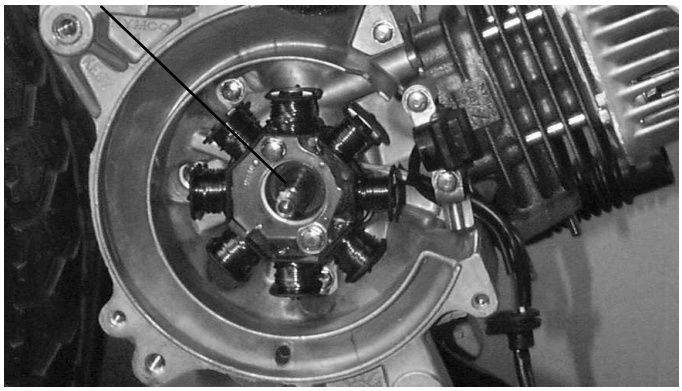
Connect the A.C. generator wire connector.

A.C. Generator Wire Connector



Clean the taper hole in the flywheel off any burrs and dirt.
Install the woodruff key in the crankshaft keyway.

Woodruff Key

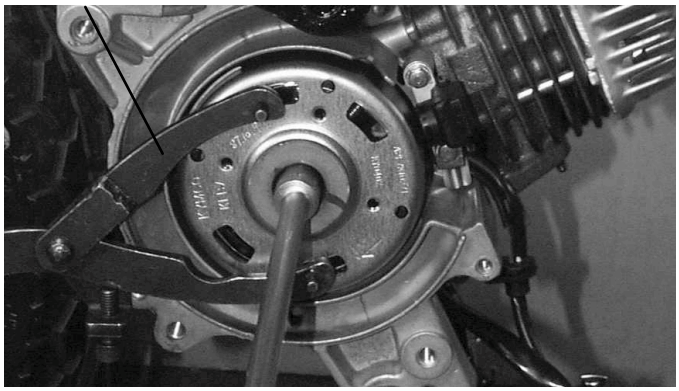


Install the flywheel onto the crankshaft with the flywheel groove aligned with the crankshaft woodruff key.
Hold the flywheel with the universal holder and install the 10mm flywheel flange nut.

Torque: 3.5_ 4.0kg-m

Start the engine and check the ignition timing. (⇨3-8)
Install other removed parts in the reserve order of removal.

Universal Holder



KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

8

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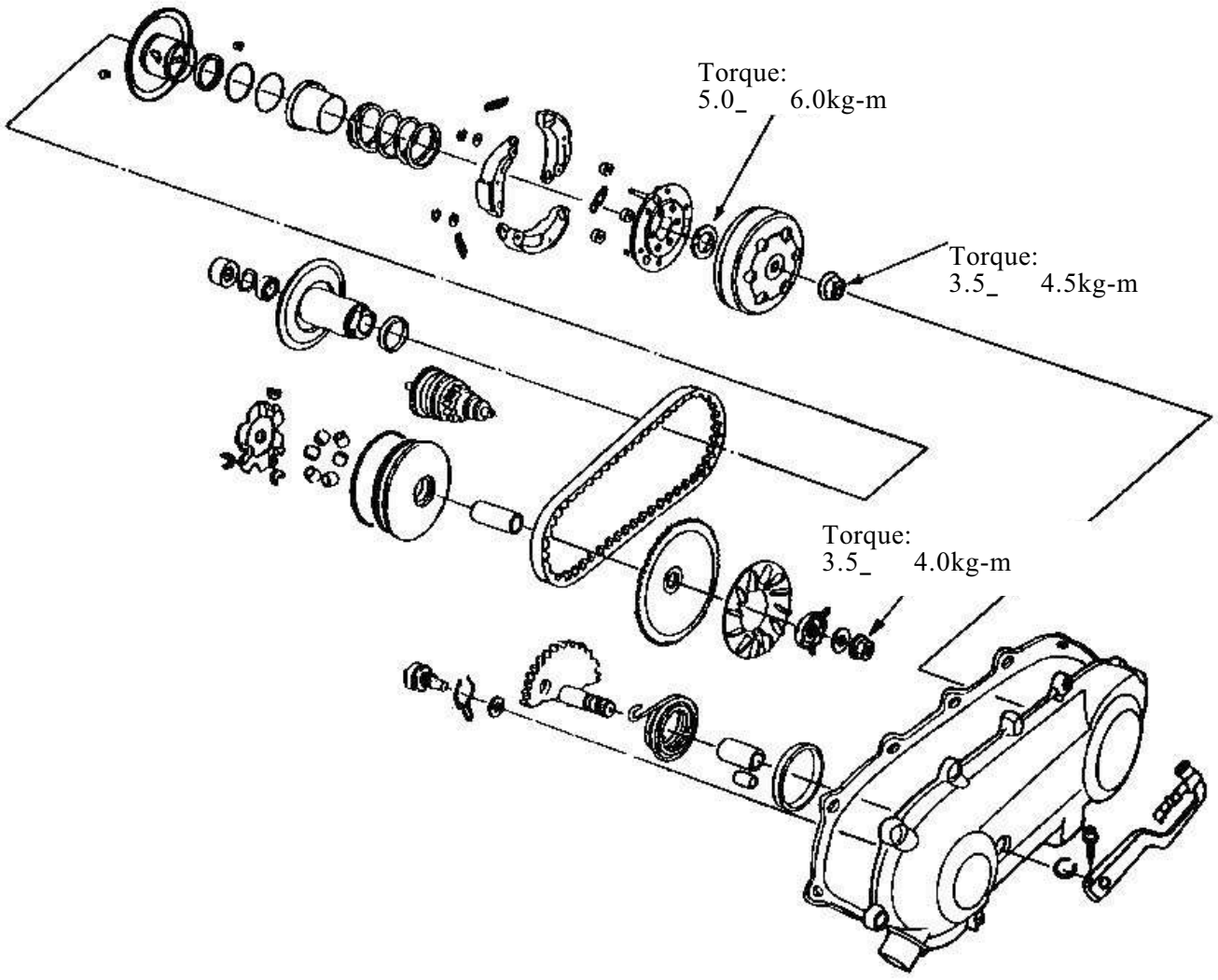
STARTER ONE-WAY CLUTCH DRIVE GEAR 8-12
CLUTCH/DRIVEN PULLEY 8-15

8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

MODEL BA10AB.AC.



8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

SERVICE INFORMATION

GENERAL INSTRUCTIONS

Avoid getting grease and oil on the drive belt and pulley faces.

SPECIFICATIONS	BA10AB.AC.50	
Item	Standard (mm)	Service Limit (mm)
Drive pulley collar O.D.	20.01_ 20.025	24.24
Movable drive face I.D.	20.035_ 20.085	19.97
Weight roller O.D.	13.0	12.4
Clutch outer I.D.	107_ 107.2	107.5
Driven face spring free length	87.9	82.6
Driven face O.D.	33.965_ 33.985	33.94
Movable driven face I.D.	34.0_ 34.25	34.06
Drive belt width	18	17

TORQUE VALUES

Drive face nut	3.5_	4.0kg-m
Clutch outer nut	3.5_	4.5kg-m
Clutch drive plate nut	5.0_	6.0kg-m

SPECIAL TOOLS

Lock nut wrench, 39mm
Clutch spring compressor
Bearing outer driver 37x40mm
One-way clutch puller
Universal holder
Lock nut socket wrench, 32mm
Bearing driver pilot, 17mm
Outer driver, 24x26mm

TROUBLESHOOTING

Engine starts but motorcycle won‘t move

Worn drive belt
Broken ramp plate
Worn or damaged clutch lining

Engine stalls or motorcycle creeps

Broken clutch weight spring

Poor performance at high speed or lack of power

Worn drive belt
Weak driven face spring
Worn weight roller
Faulty driven face

KICK STARTER

LEFT CRANKCASE COVER REMOVAL

Remove the drive belt cooling air tube connector circlip.
Remove the nine left crankcase cover bolts, left crankcase cover and dowel pins.
Inspect the left crankcase cover seal rubber for damage or deterioration.

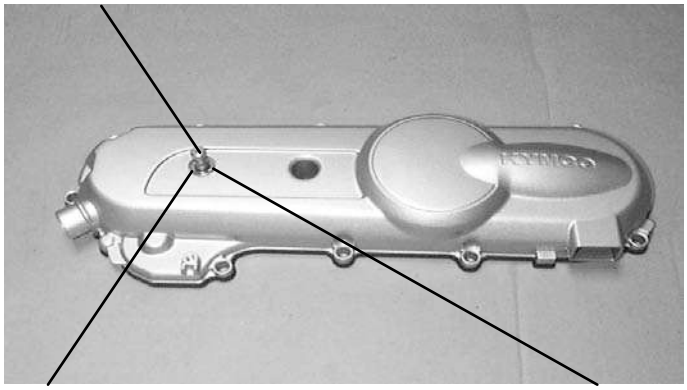
Bolt

Left Crankcase Cover

KICK STARTER SPINDLE REMOVAL

Remove the kick lever from the kick starter spindle.
Remove the circlip and washer from the kick starter spindle.

Kick Starter Spindle

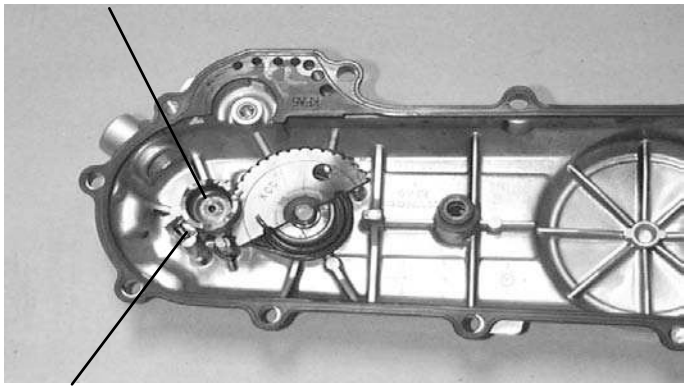


Washer

Circlip

Slightly rotate the kick starter spindle to remove the kick starter driven gear together with the friction spring.

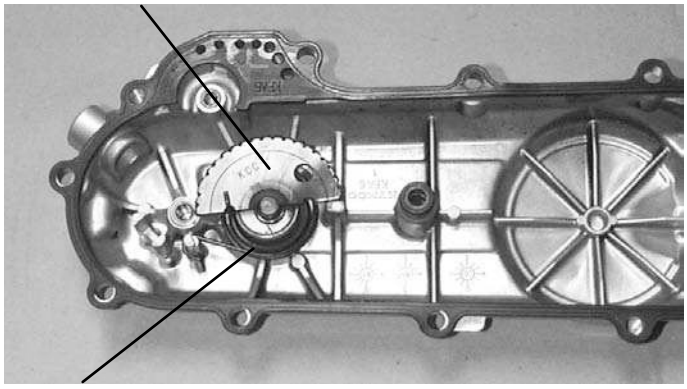
Kick Starter Driven Gear



Friction Spring

Remove the kick starter spindle and return spring from the left crankcase cover.
Remove the kick starter spindle bushing.

Kick Starter Spindle

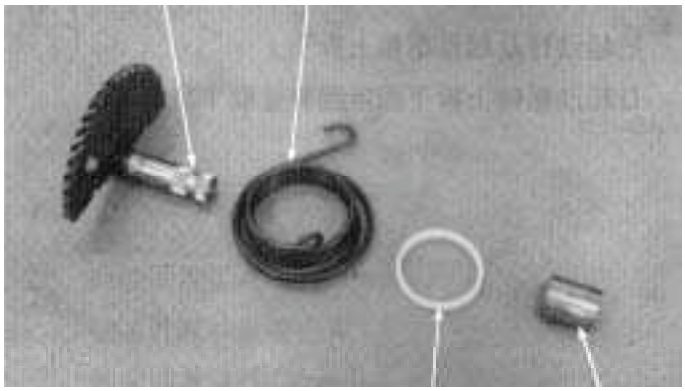


Return Spring

KICK STARTER SPINDLE INSPECTION

Inspect the kick starter spindle and gear for wear or damage.
Inspect the return spring for weakness or damage.
Inspect the kick starter spindle bushing for wear or damage.

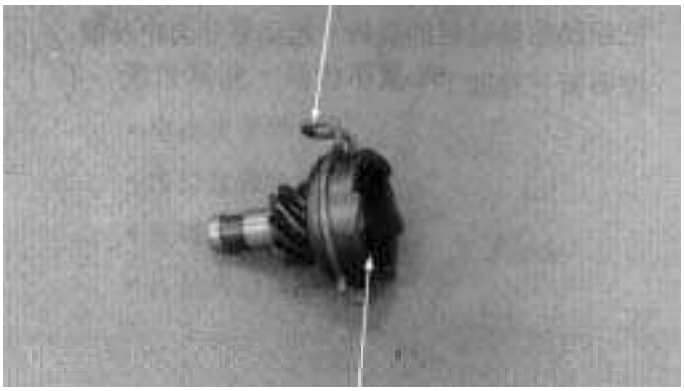
Spindle Return Spring



Plastic Bushing Spindle Bushing

Check the kick starter driven gear for wear or damage.
Check the friction spring for wear or damage.

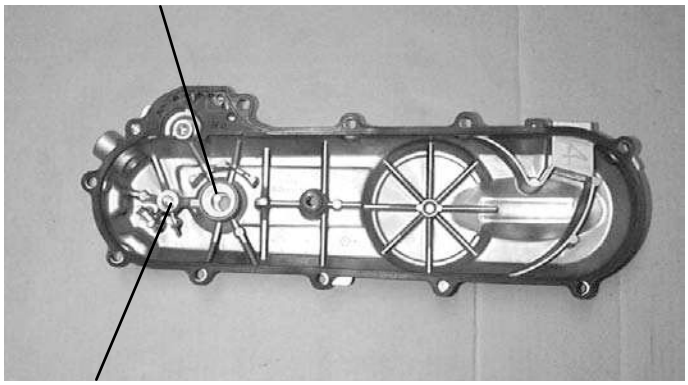
Friction Spring



Kick Starter Driven Gear

Inspect the kick starter spindle and driven gear forcing parts for wear or damage.

Kick Starter Spindle Forcing Part

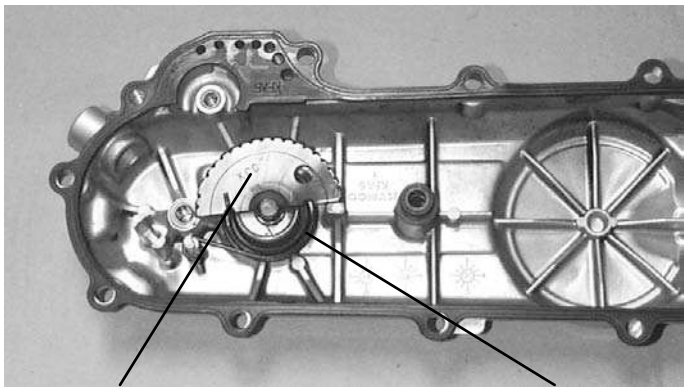


Kick Starter Driven Gear Forcing Part

KICK STARTER INSTALLATION

Install the kick starter spindle bushing and return spring onto the left crankcase cover.

✱ If the hooks of the return spring can not be installed properly, use a screw driver to press them into their locations respectively.

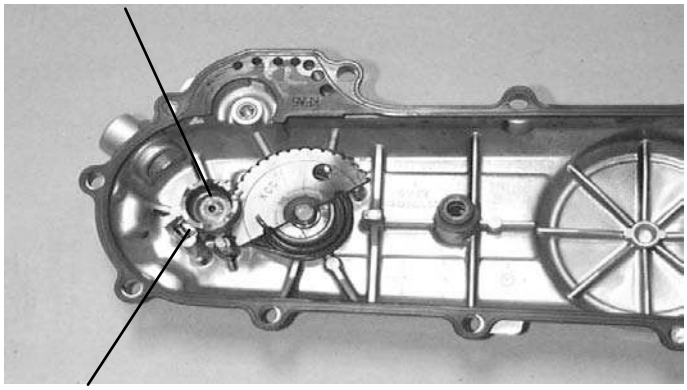


Kick Starter Spindle

Friction Spring

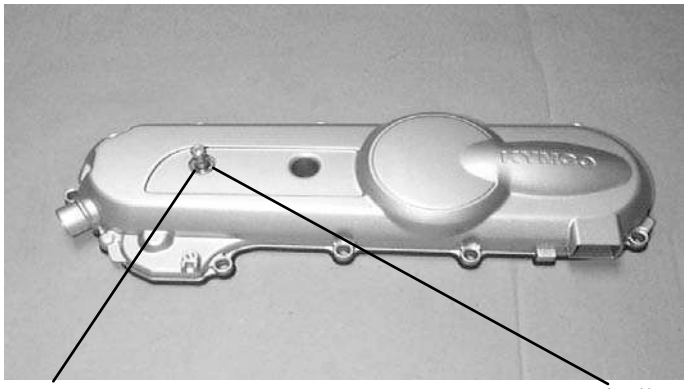
Properly install the kick starter driven gear and friction spring as the figure shown.

Kick Starter Driven Gear



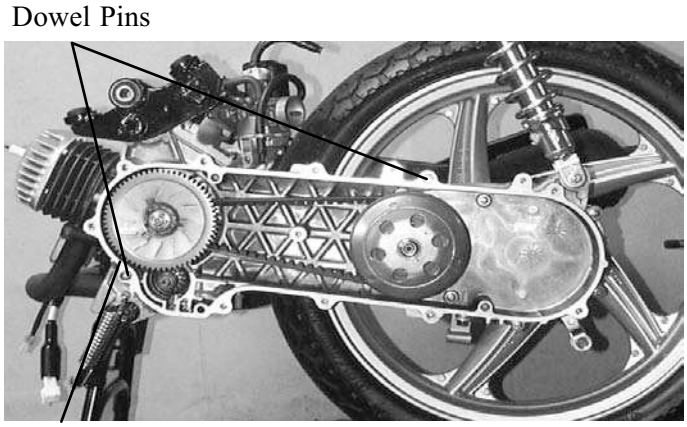
Friction Spring

First install the washer and then the circlip onto the kick starter spindle.
Install the kick lever.



LEFT CRANKCASE COVER INSTALLATION

First install the dowel pins and then the seal rubber.



Install the left crankcase cover and tighten the ten bolts diagonally.
Connect the drive belt cooling air tube and install the circlip.

✱ For drum brake, note the location of the brake cable clamp and install the rear brake cable in place with the clamp.

DRIVE BELT

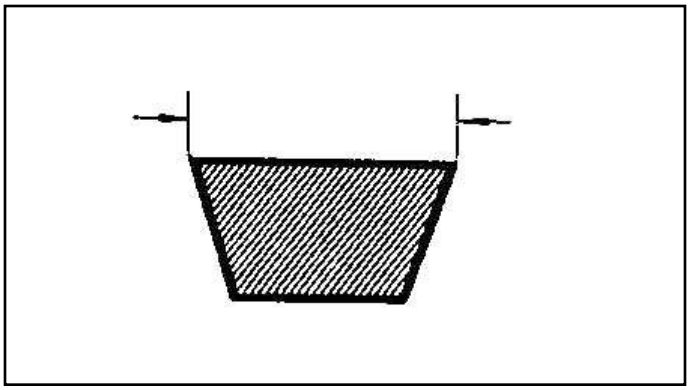
Remove the left crankcase cover.

INSPECTION

Check the drive belt for cracks, separation or abnormal or excessive wear.
Measure the drive belt width.

Service Limit:

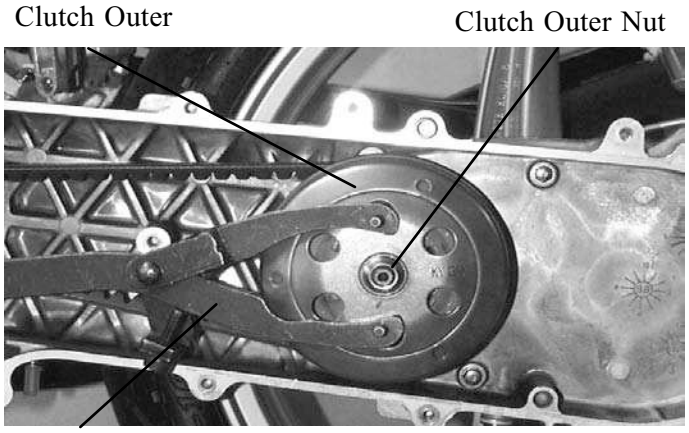
BA10AB.AC.50: 16.5mm replace if below



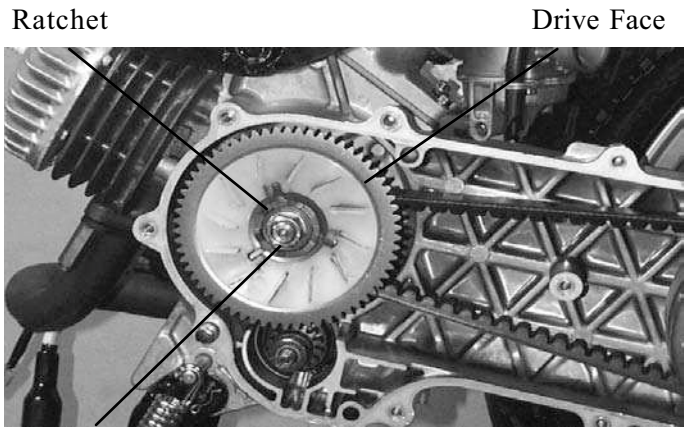
✱ Use specified genuine parts for replacement.

REPLACEMENT

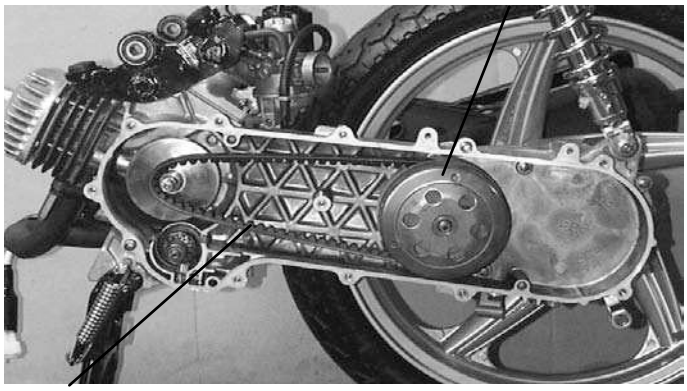
Remove the ten left crankcase cover bolts and left crankcase cover. (⇨8-4)
Hold the clutch outer with the universal holder and remove the 10mm clutch outer nut and clutch outer.



Hold the drive pulley with the holder and remove the 12mm drive face nut.
Remove the starting ratchet.
Remove the drive pulley face.



Remove the drive belt from the clutch/ driven pulley.



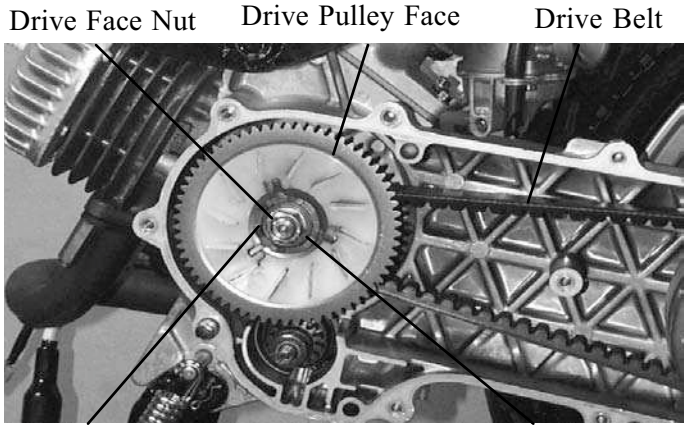
DRIVE BELT INSTALLATION

Turn the driven pulley clockwise and lift it up to expand the drive belt groove and then install a new drive belt.

Set the drive belt on the drive pulley. Install the drive pulley face, starting ratchet and 12mm washer, then tighten the drive face nut.

Torque: 3.5_ 4.0kg-m

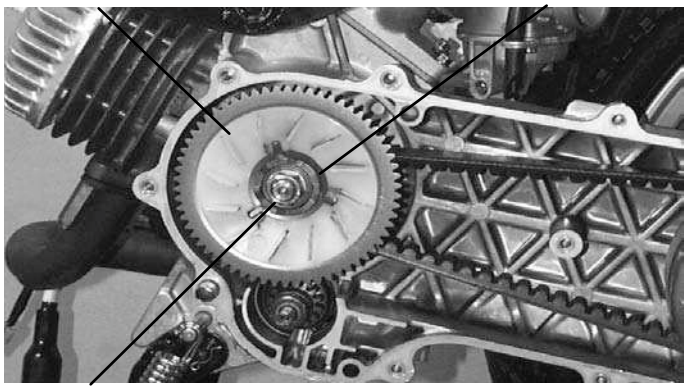
✱ When installing the drive face nut, make sure that the tooth spaces of the drive pulley face and starting ratchet align with the teeth of the crankshaft.



DRIVE PULLEY

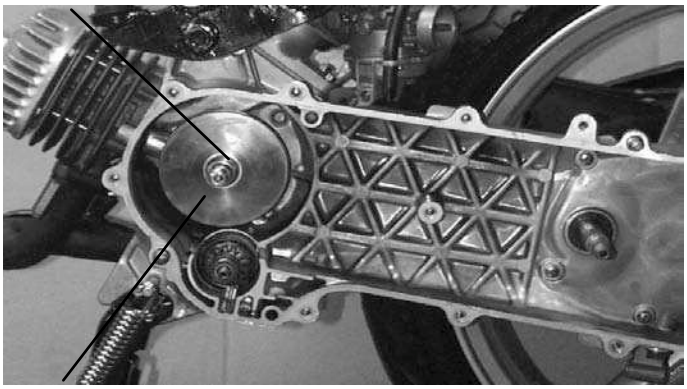
REMOVAL

Hold the drive pulley with the holder and remove the 12mm drive face nut.
Remove the starting ratchet, 12mm washer and drive pulley face.

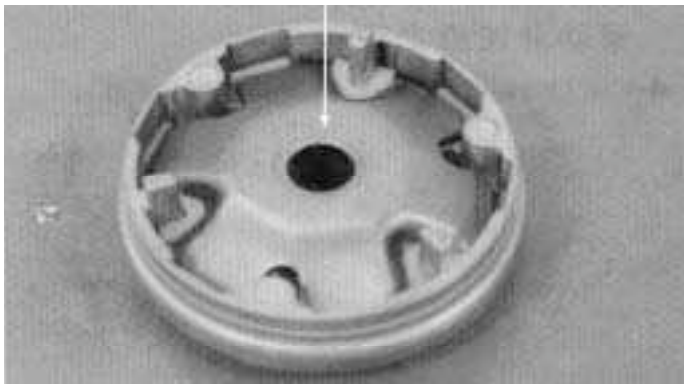


MOVABLE DRIVE FACE DISASSEMBLY

Remove the movable drive face and drive pulley collar from the crankshaft.

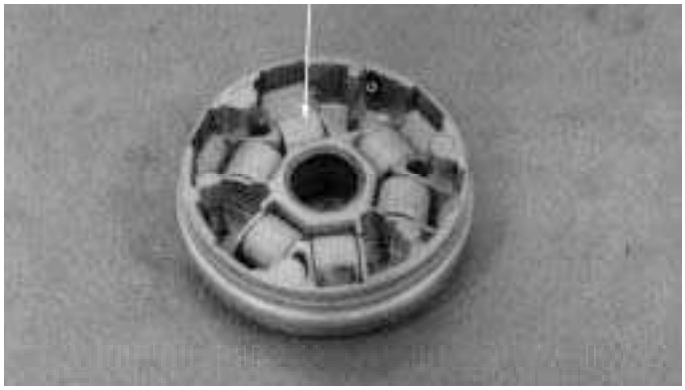


Remove the ramp plate.



Remove the weight rollers.

Weight Roller



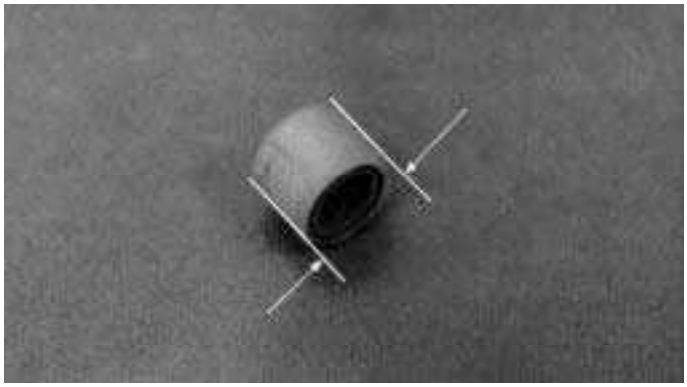
MOVABLE DRIVE FACE INSPECTION

Check each weight roller for wear or damage.

Measure each roller O.D.

Service Limit:

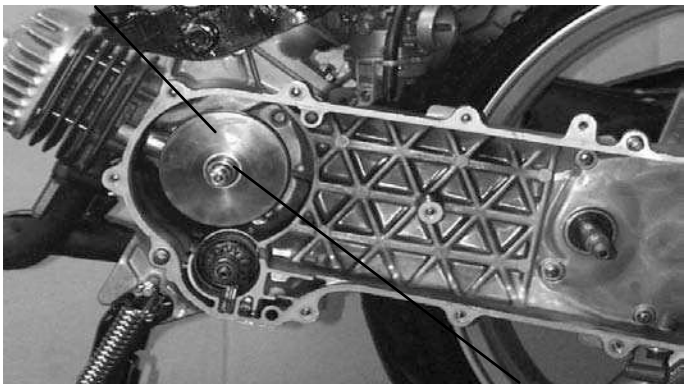
BA10AB.AC.50: 12.4mm replace if below



DRIVE PULLEY INSTALLATION

Install the drive pulley collar and movable drive face onto the crankshaft.

Movable Drive Face



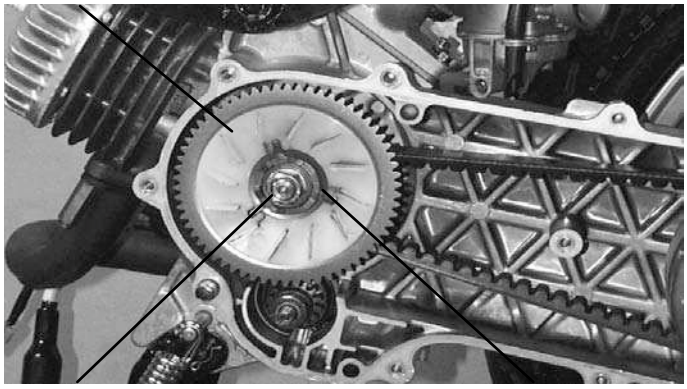
Drive Pulley Collar

Install the drive belt on the crankshaft.
Install the drive face, starting ratchet and washer, then tighten the 12mm drive face nut.

Torque: 3.5_ 4.0kg-m

✱ Keep grease or oil off the drive belt and drive pulley faces.

Drive Pulley Face



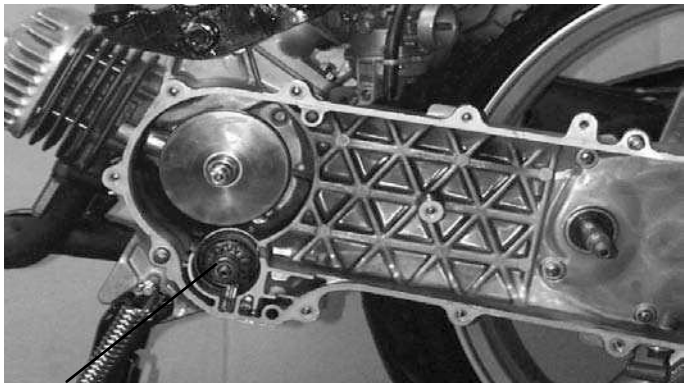
Drive Face Nut

Starting Ratchet

STARTER PINION

REMOVAL

Remove the left crankcase cover. (⇨8-4)
Remove the drive pulley. (⇨8-8)
Remove the starter pinion.



Starter Pinion

INSPECTION

Inspect the starter pinion seat for wear.
Inspect the starter pinion for smooth operation.
Inspect the starter pinion shaft forcing parts for wear and damage.

Shaft Forcing Parts

Starter Pinion

INSTALLATION

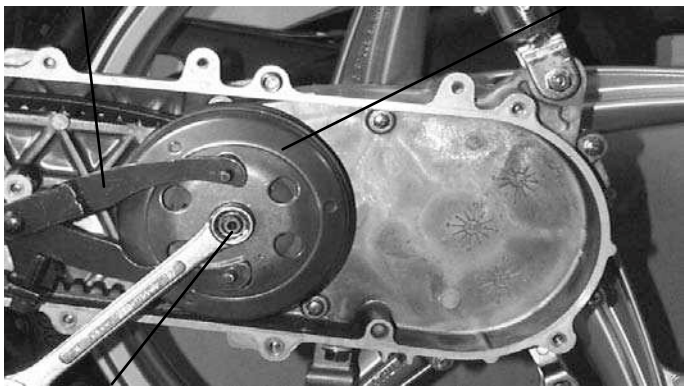
Apply a small amount of grease to the starter pinion teeth.
Install the starter pinion in the reverse order of removal.

CLUTCH/DRIVEN PULLEY

CLUTCH/DRIVEN PULLEY REMOVAL

Remove the drive pulley. (⇨8-8)
Hold the clutch outer with the universal holder and remove the 10mm clutch outer nut.
Remove the clutch outer.

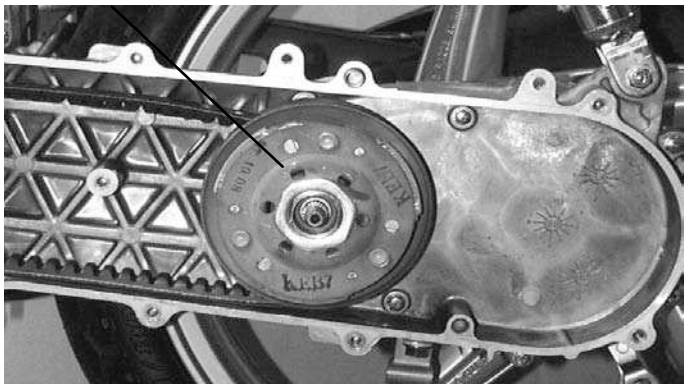
Universal Holder Clutch Outer



10mm Clutch Outer Nut

Remove the clutch/driven pulley.
Remove the drive belt from the clutch/driven pulley.

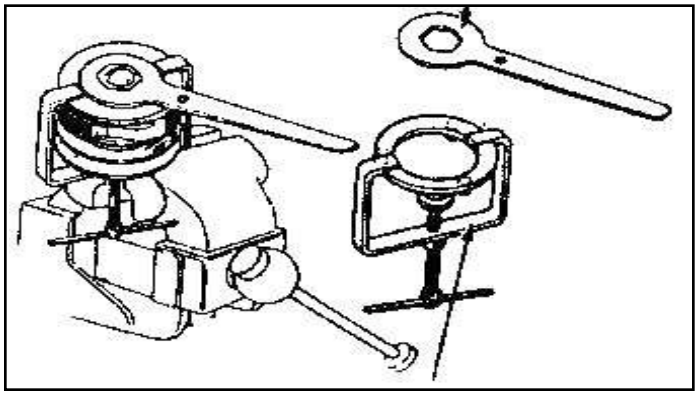
Clutch/Driven Pulley



CLUTCH/DRIVEN PULLEY DISASSEMBLY

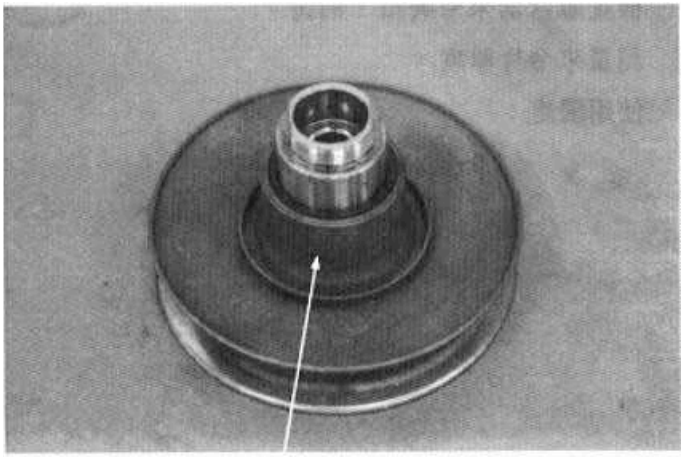
Compress the clutch/driven pulley spring with the clutch spring compressor and remove the 28mm drive plate nut.
Remove the driven face spring.

Lock Nut Wrench, 39mm



Clutch Spring Compressor

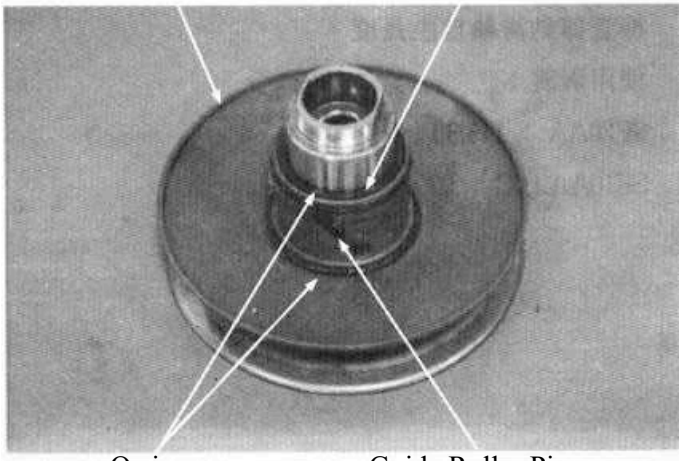
Remove the seal collar.



Seal Collar

Driven Pulley Oil Seal

Pull out the guide roller pins from the driven pulley and then remove the O-rings and oil seal from the driven pulley.



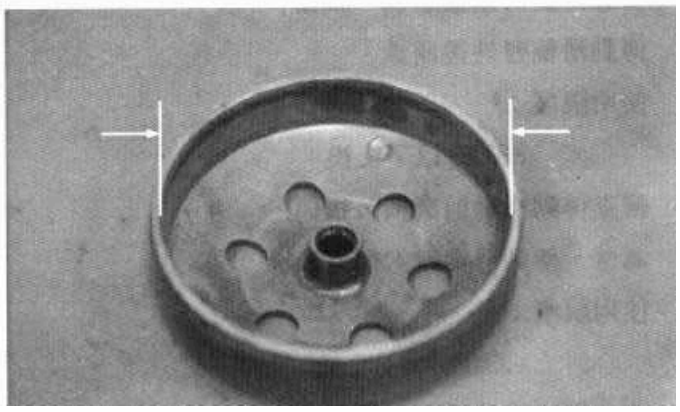
O-rings Guide Roller Pin

CLUTCH/DRIVEN PULLEY INSPECTION

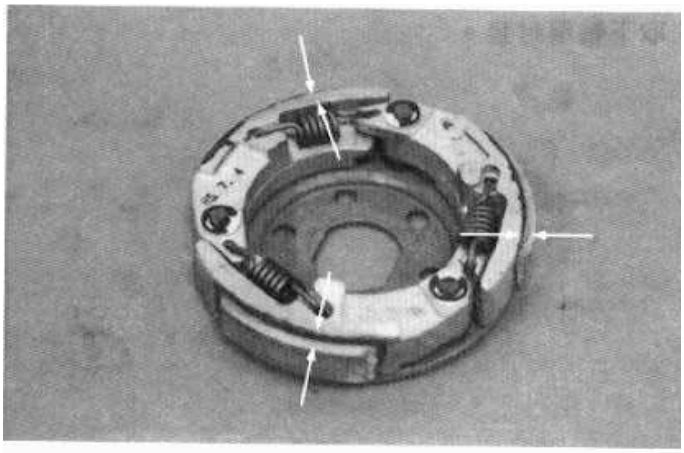
Inspect the clutch outer for wear or damage. Measure the clutch outer I.D.

Service Limit:

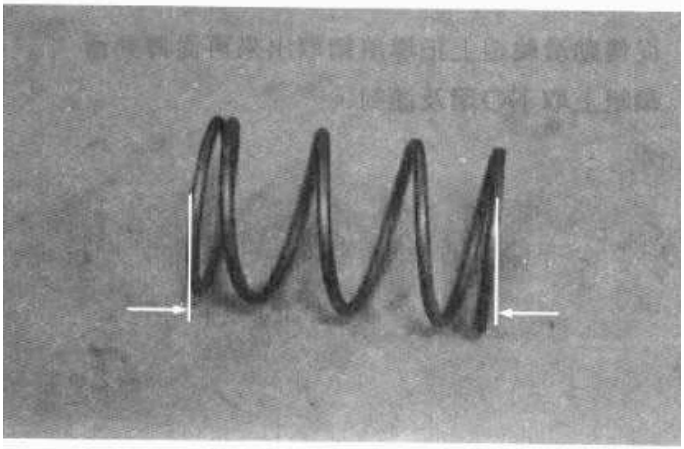
BA10AB.AC.50: 107.5mm replace if below



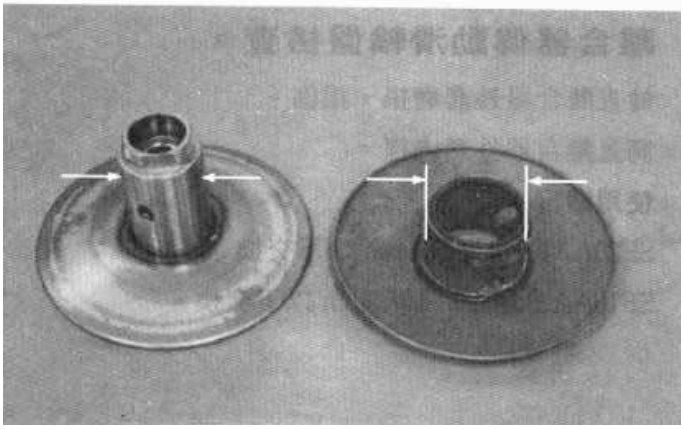
Check the clutch shoes for wear or damage.
Measure the clutch lining thickness.
Service Limit: 2.0mm replace if below



Measure the driven face spring free length.
Service Limit:
BA10AB.AC.50: 82.6mm replace if below



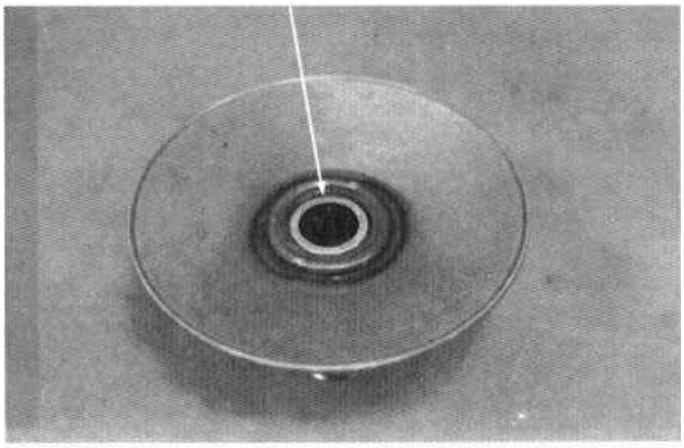
Check the driven face assembly for wear or damage.
Measure the driven face O.D.
Service Limit: 33.94mm replace if below
Check the movable driven face for wear or damage.
Measure the movable driven face I.D.
Service Limit: 34.06mm replace if below
Check the guide roller pins for stepped wear.



DRIVEN PULLEY FACE BEARING REPLACEMENT

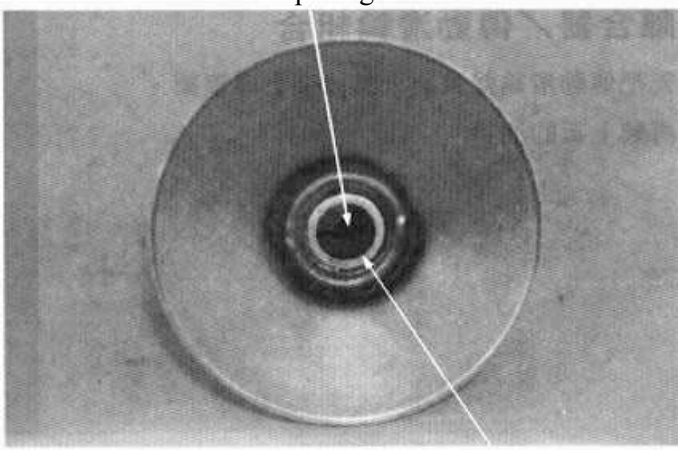
Check the needle bearings in the driven face and replace them if they have excessive play, damage or abnormal noise.
Drive the inner bearing out of the driven pulley face.

Inner Bearing



Remove the snap ring and drive the outer bearing out of the driven face.

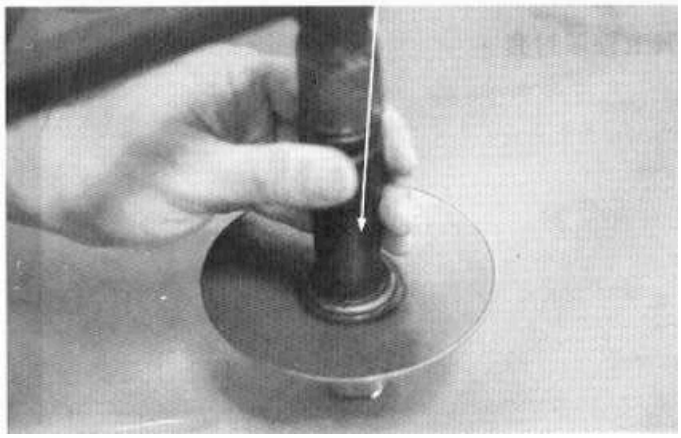
Snap Ring



Outer Bearing

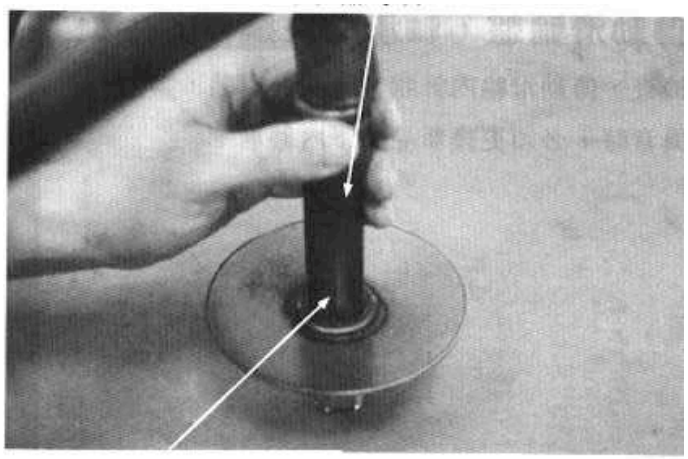
Drive a new outer bearing into the driven face with the sealed end facing up.
Seat the snap ring in its groove.

Bearing Outer Driver, 37x40mm



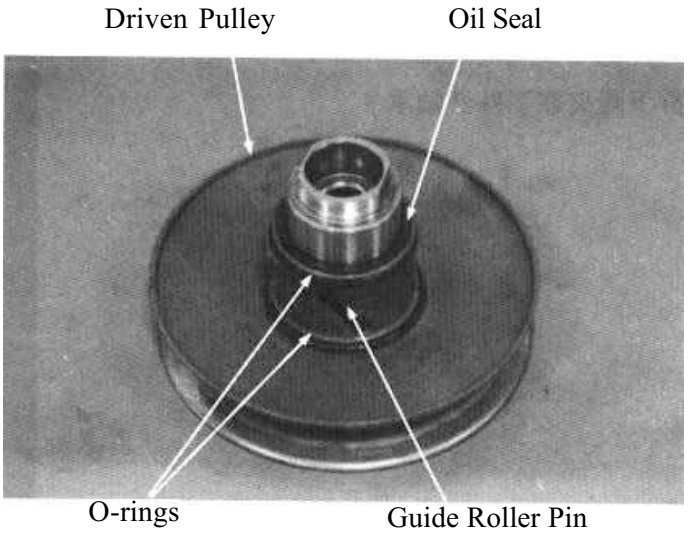
✱ Pack all bearing cavities with 5.0_ 5.6g grease.
Specified grease: 230℃ Heat-resistant grease

Drive in a new needle bearing into the driven face with the mark facing up.

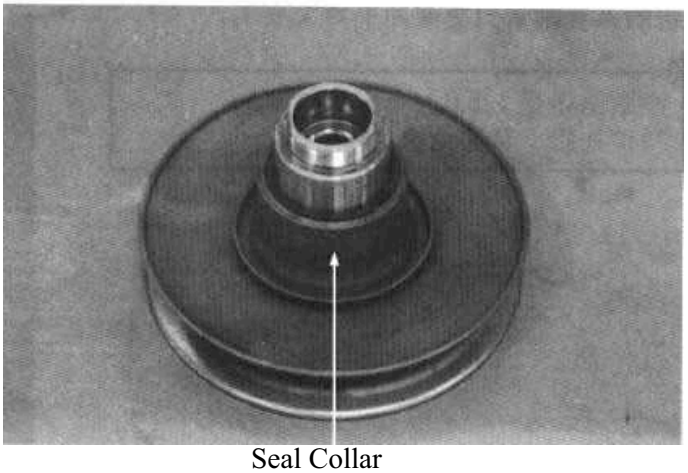


CLUTCH/DRIVEN PULLEY ASSEMBLY

First install the movable driven face onto the driven face. Then, install the guide roller pins, O-rings and a new oil seal.

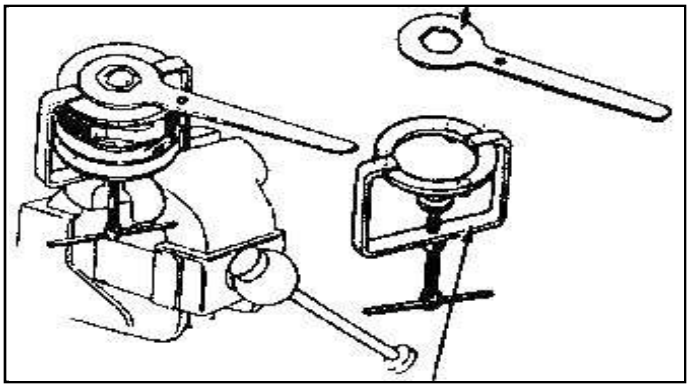


Install the seal collar.



Set the driven pulley, driven face spring and clutch assembly onto the clutch spring compressor. Compress the tool and install the 28mm drive plate nut.
Tighten the 28mm nut to the specified torque.

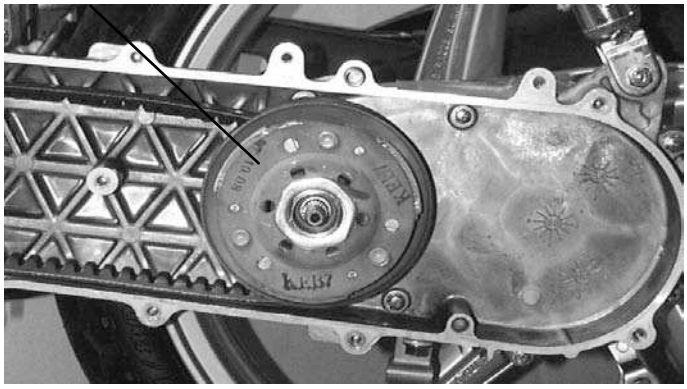
Torque: 5.0_ 6.0kg-m



CLUTCH/DRIVEN PULLEY INSTALLATION

Install the drive belt on the clutch/driven pulley and then install the clutch/driven pulley onto the drive shaft.

Clutch/Driven Pulley

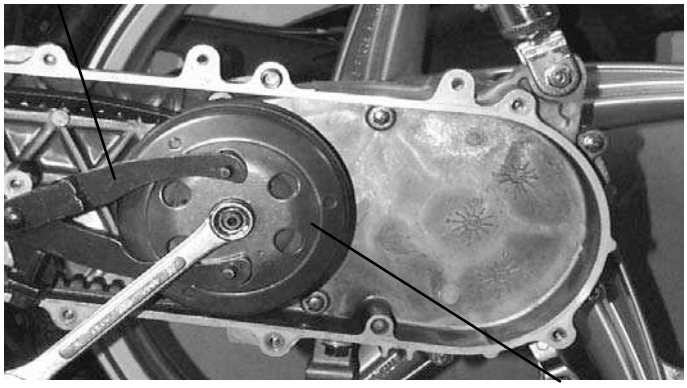


Install the clutch outer.
Hold the clutch outer with the universal holder.
Install and tighten the 10mm clutch outer nut.

Torque: 3.5_ 4.5kg-m

Install the left crankcase cover. (⇨8-7)

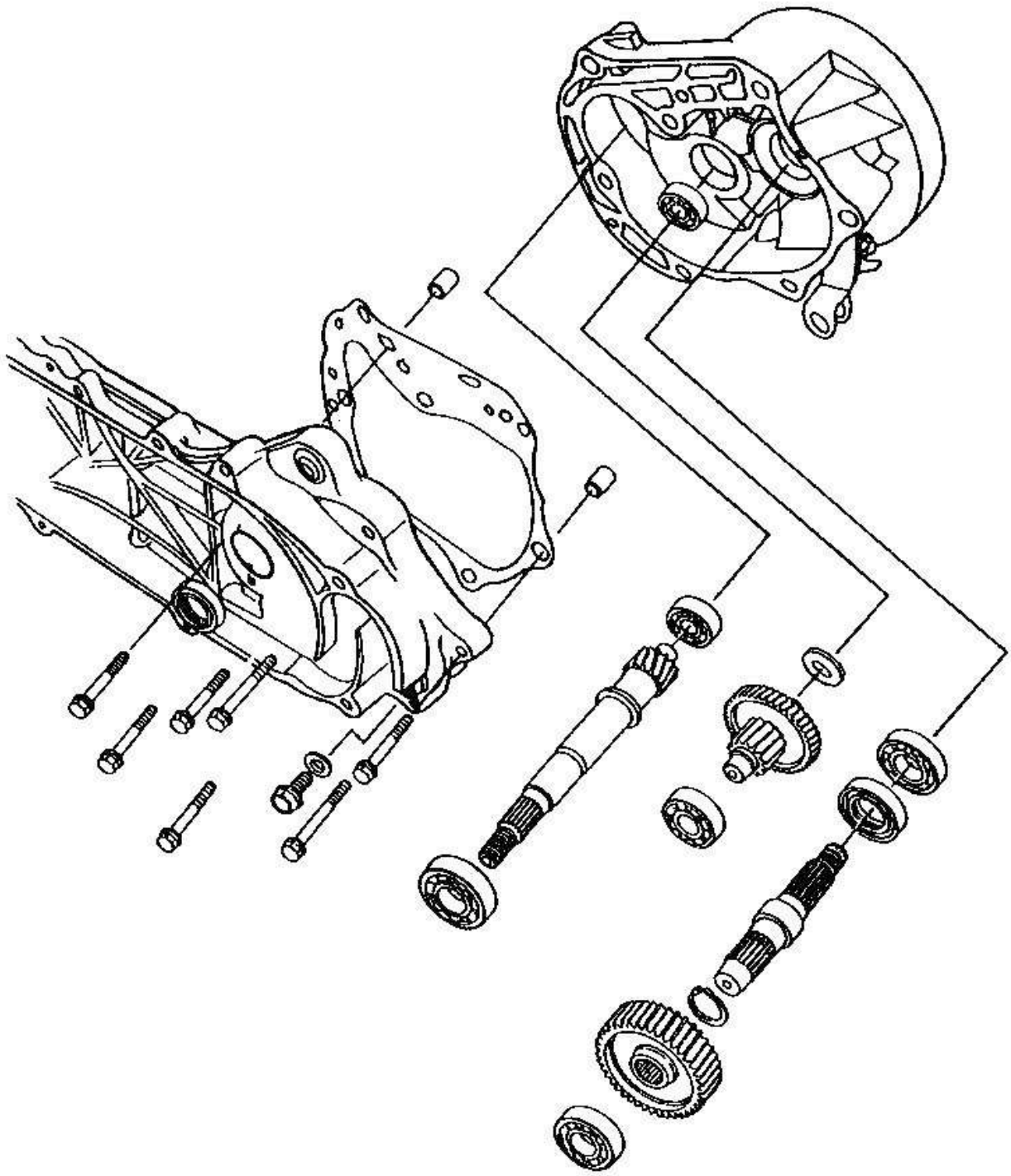
Universal Holder



Clutch Outer

FINAL REDUCTION

SERVICE INFORMATION 9-2
TROUBLESHOOTING 9-2
FINAL REDUCTION DISASSEMBLY 9-3
FINAL REDUCTION INSPECTION 9-3
FINAL REDUCTION ASSEMBLY 9-6



SERVICE INFORMATION

Specified Oil: SAE90#
At disassembly: 0.12 liter
At change: 0.1 liter

SPECIAL TOOLS

Bearing remover set, 12mm
Bearing remover set, 15mm
Crankcase assembly collar
Crankcase assembly shaft
Bearing outer driver, 37x40mm
Bearing outer driver, 32x35mm
Bearing driver pilot, 17mm
Bearing driver pilot, 15mm
Bearing driver pilot, 12mm
Bearing outer driver handle A

TROUBLESHOOTING

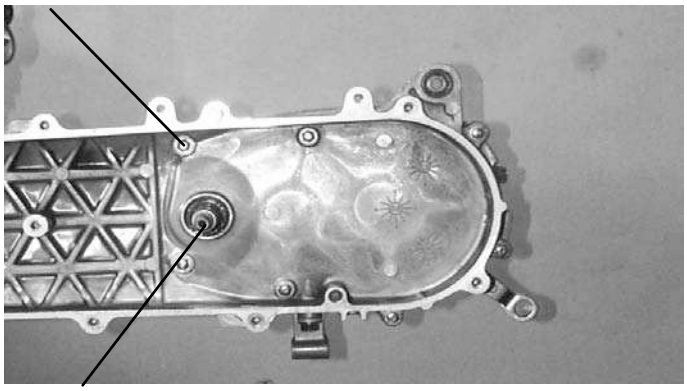
Engine starts but motorcycle won‘t move
Damaged transmission
Seized or burnt transmission

Abnormal noise
Worn, seized or chipped gears
Worn bearing

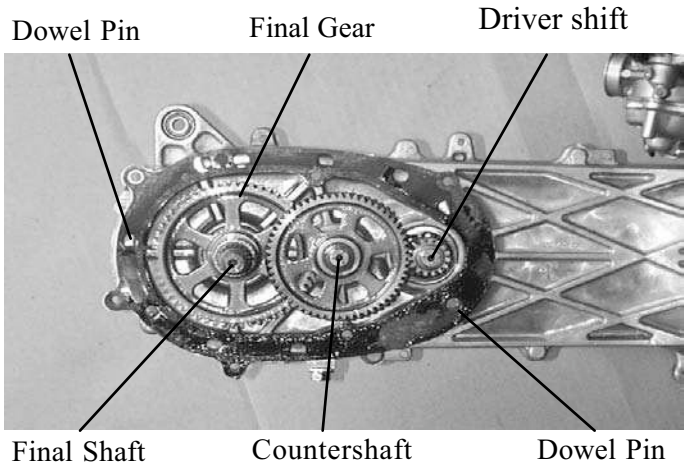
Oil leaks
Oil level too high
Worn or damaged oil seal

FINAL REDUCTION DISASSEMBLY

Remove the rear wheel. (⇨14-3)
Remove the left crankcase cover. (⇨8-4)
Remove the clutch/driven pulley. (⇨8-15)
Drain the transmission gear oil into a clean container.
Remove the transmission case cover attaching bolts.
Remove the transmission case cover.
Remove the gasket and dowel pins.

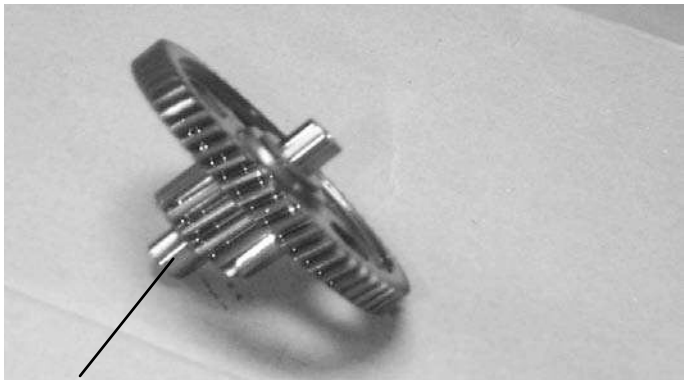


Remove the final gear and countershaft.

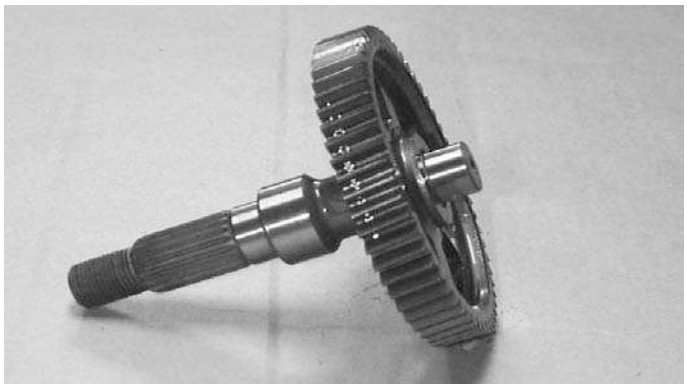


FINAL REDUCTION INSPECTION

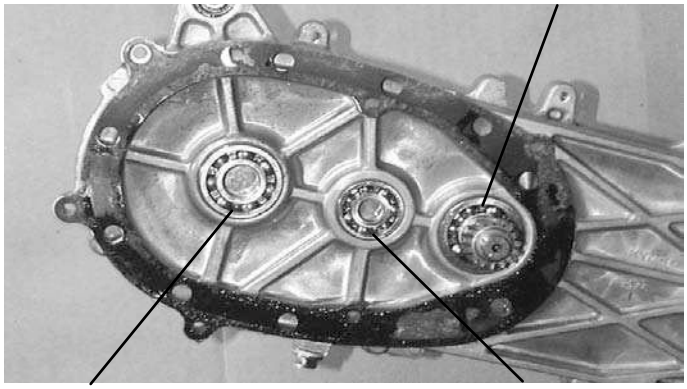
Inspect the countershaft and gear for wear or damage.



Inspect the final gear and final shaft for wear, damage or seizure.

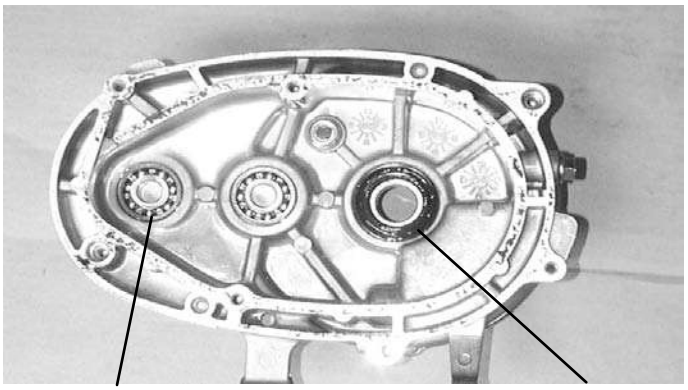


Check the left crankcase bearings for excessive play and inspect the oil seal for wear or damage.



Inspect the drive shaft and gear for wear or damage.
Check the transmission case cover bearings for excessive play and inspect the final shaft bearing oil seal for wear or damage.

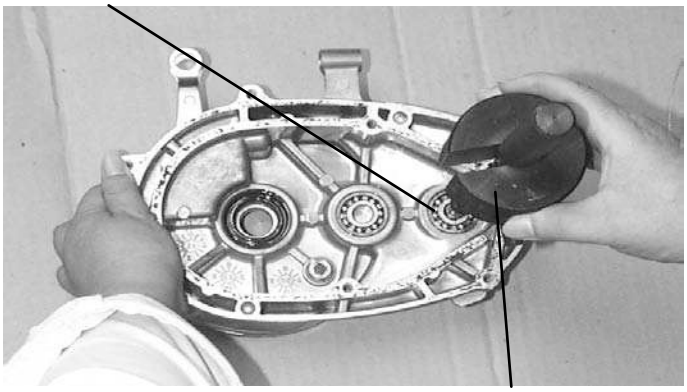
✱ Do not remove the transmission case cover except for necessary part replacement. When replacing the drive shaft, also replace the bearing and oil seal.



BEARING REPLACEMENT (Transmission Case Cover)

Remove the transmission case cover bearings using the bearing remover.
Remove the final shaft oil seal.

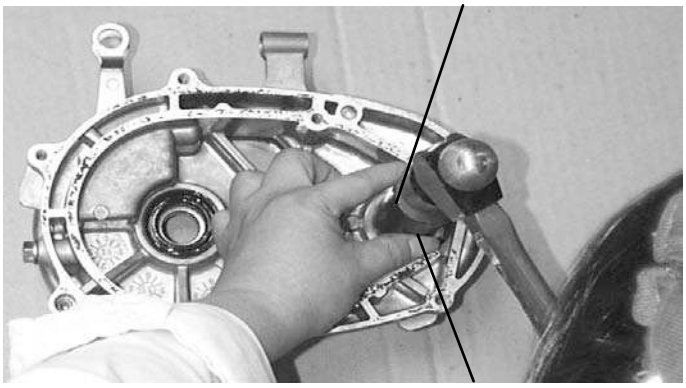
Drive Shaft Bearing



Bearing Remover Set

Drive new bearings into the transmission case cover.

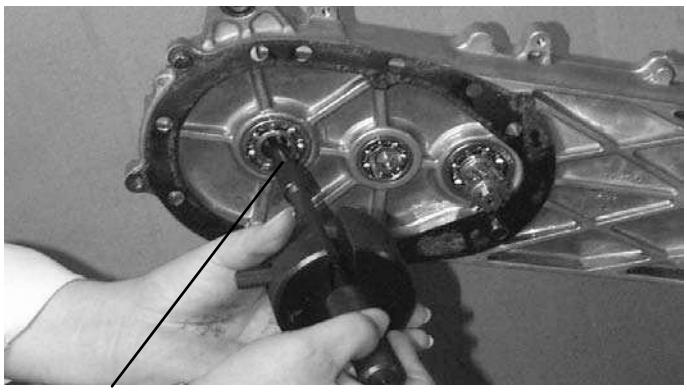
Bearing Outer Driver Handle A



Bearing Outer Driver, 32x35mm

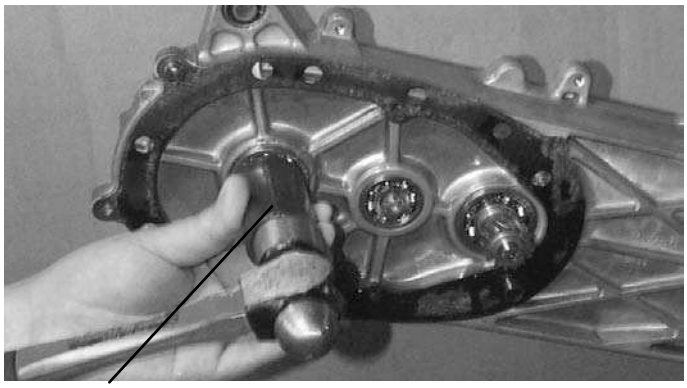
BEARING REPLACEMENT (Left Crankcase Cover)

Remove the drive shaft.
Remove the drive shaft oil seal.
Remove the left crankcase bearings using the bearing remover.



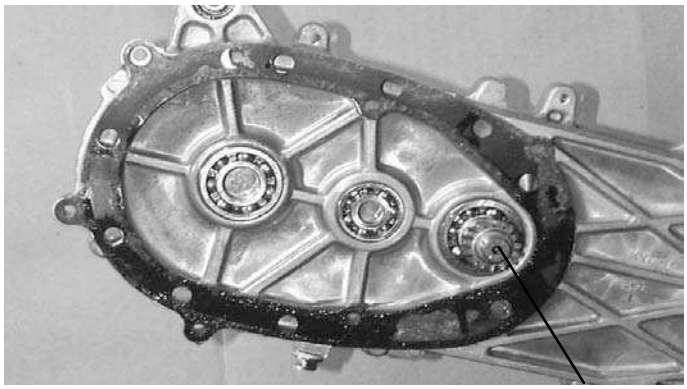
Bearing Remover Set, 12mm

Drive new bearings into the left crankcase.
Install a new drive shaft oil seal.

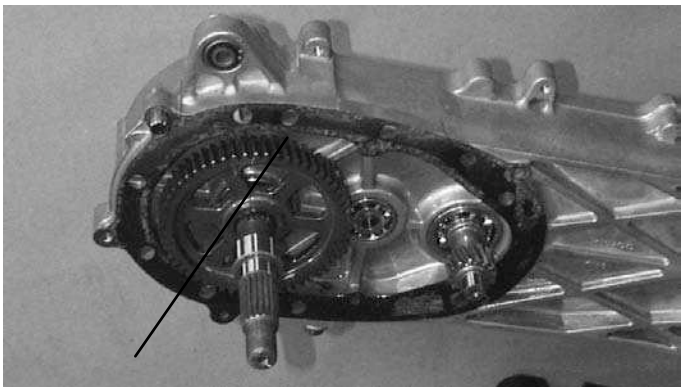

Bearing Outer Driver

FINAL REDUCTION ASSEMBLY

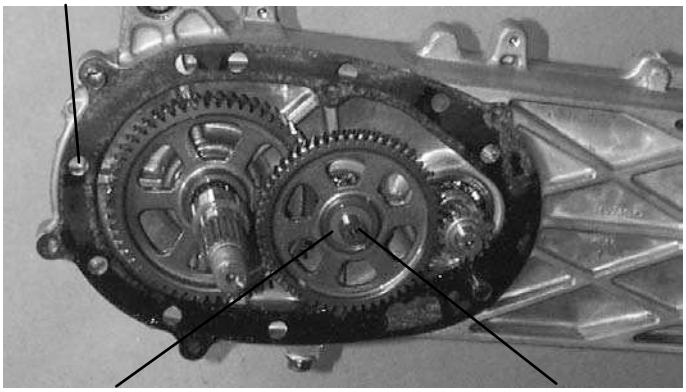
Install the drive shaft into the left crankcase.


Drive Shaft

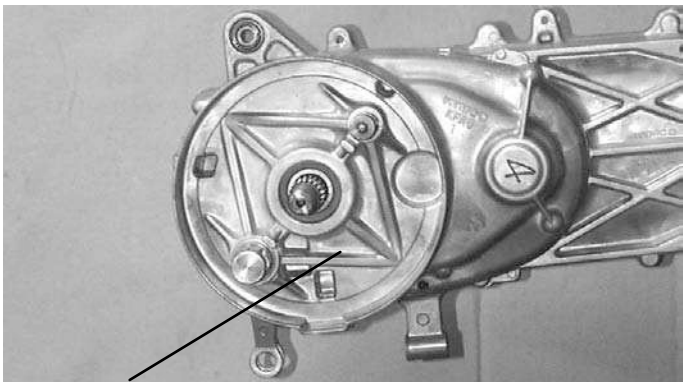
Install the final gear and final shaft into the left crankcase.



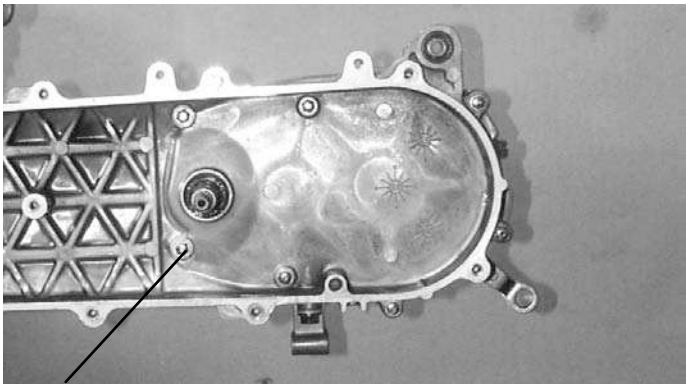
Install the countershaft and gear into the left crankcase.
Install the resin washer onto the countershaft.
Install the dowel pins and a new gasket.



Install the transmission case cover.



Install and tighten the transmission case cover bolts.
Install the clutch/driven pulley. (⇨8-20)
Install other removed parts in the reverse order of removal.



After installation, fill the transmission case with the specified oil.

✱

Place the motorcycle on its main stand on level ground.

Check the sealing washer for wear or damage.

Specified Gear Oil: SAE90#

Oil Capacity: at disassembly: 0.12 liter

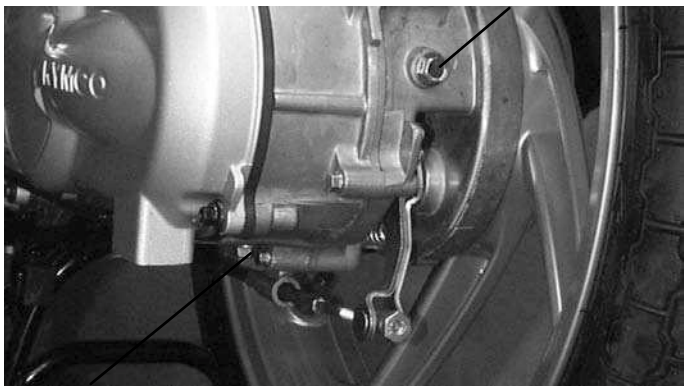
at change: 0.09 liter

Install and tighten the oil check bolt.

Torque: 1.0_ 1.5kg-m

Start the engine and check for oil leaks. Check the oil level from the oil check bolt hole and add the specified oil to the proper level if the oil level is low.

Oil Check Bolt Hole/Filler



Drain Bolt

CRANKCASE/CRANKSHAFT

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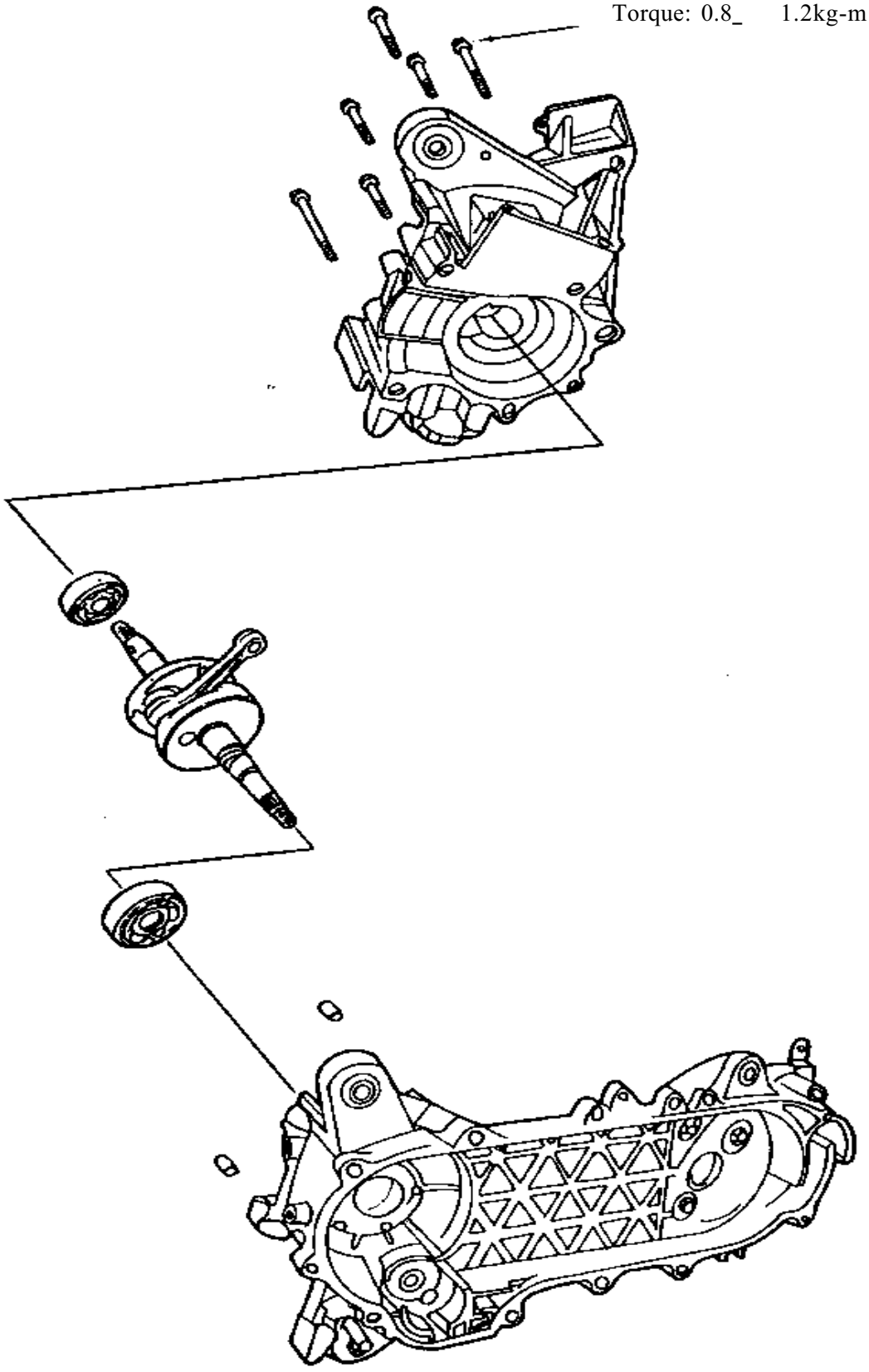
TROUBLESHOOTING 10-2
CRANKCASE SEPARATION 10-3
CRANKSHAFT REMOVAL 10-3
CRANKSHAFT INSPECTION 10-4
CRANKSHAFT INSTALLATION 10-5
CRANKCASE ASSEMBLY 10-7


Torque: 0.8_ 1.2kg-m

SERVICE INFORMATION

GENERAL INSTRUCTIONS

This section covers crankcase separation to service the crankshaft.

The following parts must be removed before separating the crankcase.

Engine (⇨Section 5)
Carburetor (⇨Section 11)
Oil pump (⇨Section 4)
Reed valve (⇨Section 11)
Driven pulley (⇨Section 9)
A.C. generator (⇨Section 7)
Cylinder head/cylinder (⇨Section 6)

When the left crankcase must be replaced, remove the following part in addition to the above.

Final reduction removal

Special tools must be used for crankshaft and crankcase assembly. When separating the crankcase, the bearing will remain in the crankcase and it should be removed. When, assembling, drive a new bearing into the crankcase and install a new oil seal.

SPECIFICATIONS

	BA10AB.AC.50	
Item	Standard (mm)	Service Limit (mm)
Connecting rod big end side clearance	—	0.60
Connecting rod big end radial clearance	—	0.04
Crankshaft runout A/B	—	0.15/0.10

SPECIAL TOOLS

Crankcase puller
Universal bearing puller
Crankcase assembly collar
Crankcase assembly tool
Bearing outer driver handle A
Bearing outer driver, 42x47mm
Bearing driver pilot, 20mm
Bearing outer driver, 37x40mm
Bearing driver pilot, 17mm

TROUBLESHOOTING

Abnormal engine noise

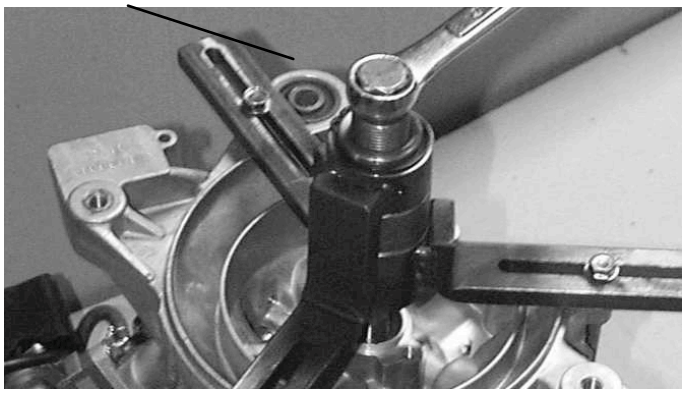
Excessive crank journal bearing play
Excessive crankpin bearing play
Excessive transmission bearing play

CRANKCASE SEPARATION

Remove the crankcase attaching bolts.

Attach the crankcase puller on the right crankcase and remove the right crankcase from the left crankcase.

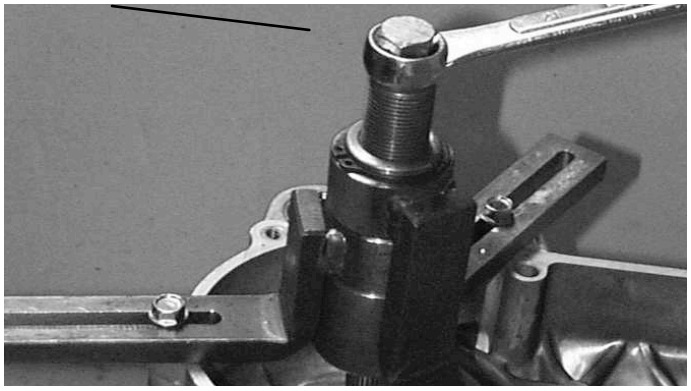
Crankcase Puller



CRANKSHAFT REMOVAL

Attach the crankcase puller on the left crankcase and remove the crankshaft from the left crankcase.

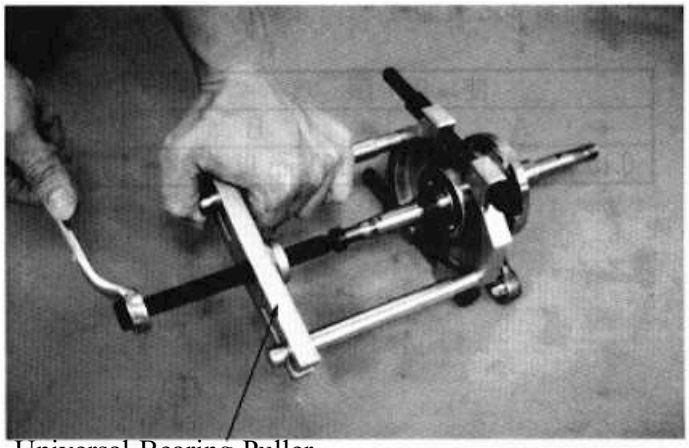
Crankcase Puller



✱ When removing the crankshaft, do it slowly and gently.

Remove the remaining bearing on the crankshaft side using the universal bearing puller.

✱ When separating the crankcase, the oil seals must be removed. Replace the oil seals with new ones.

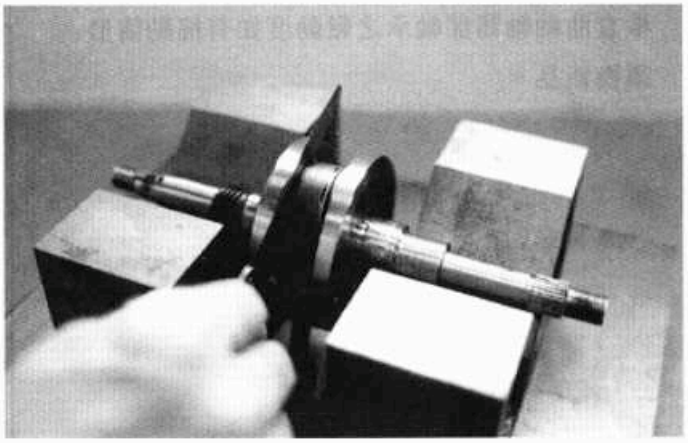


Universal Bearing Puller

CRANKSHAFT INSPECTION

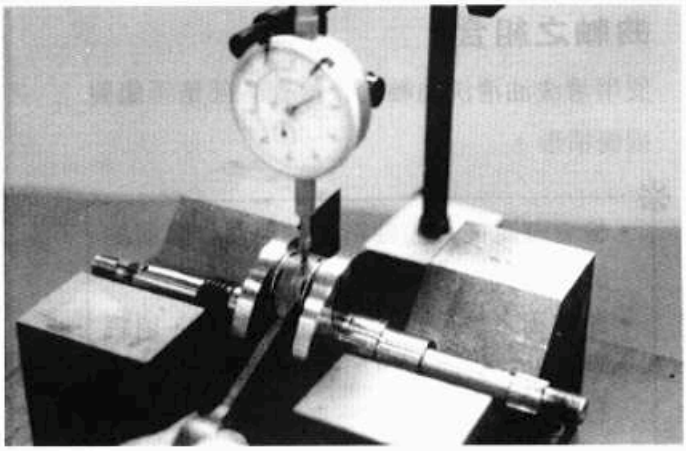
Measure the connecting rod big end side clearance.

Service Limit: 0.6mm replace if over



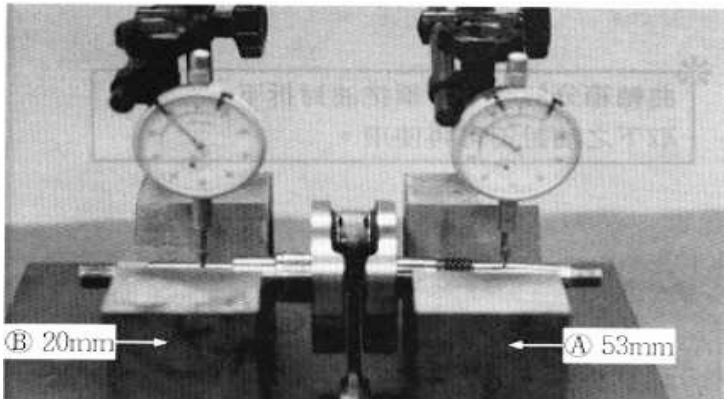
Measure the connecting rod big end radial clearance at two points in the X and Y directions.

Service Limit: 0.04mm replace if over

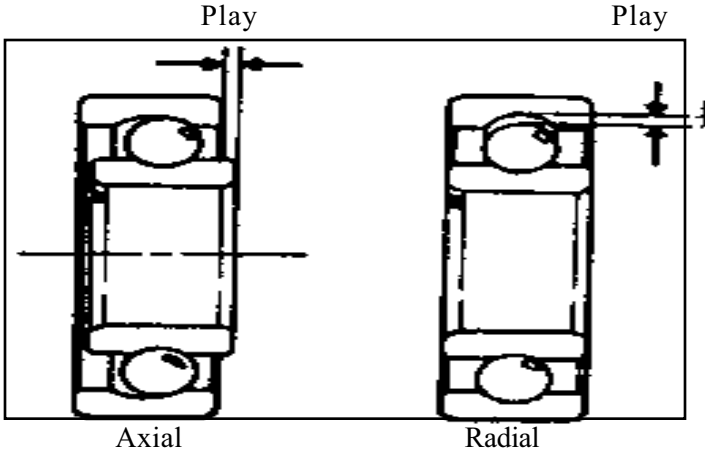


Measure the crankshaft runout.

Service Limit	
A	B
0.150mm replace if over	0.100mm replace if over

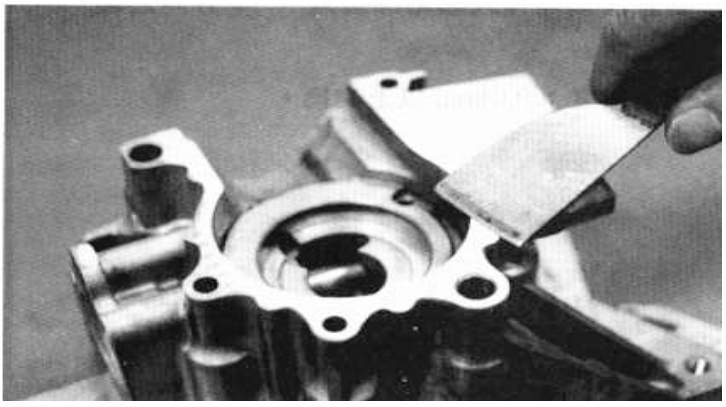


Check the crankshaft bearings for excessive play. The bearings must be replaced if they are noisy or have excessive play.



CRANKSHAFT INSTALLATION

Wash the crankshaft in cleaning solvent and then check for cracks or other faults.



✱

After check, apply clean engine oil to all moving and sliding parts.

Remove all gasket material from the crankcase mating surfaces. Dress any roughness or irregularities with an oil stone.

Drive a new crankshaft bearing into the right crankcase.

Bearing Outer Driver Handle A

Bearing Outer Driver, 37x40mm
Bearing Driver Pilot, 17mm

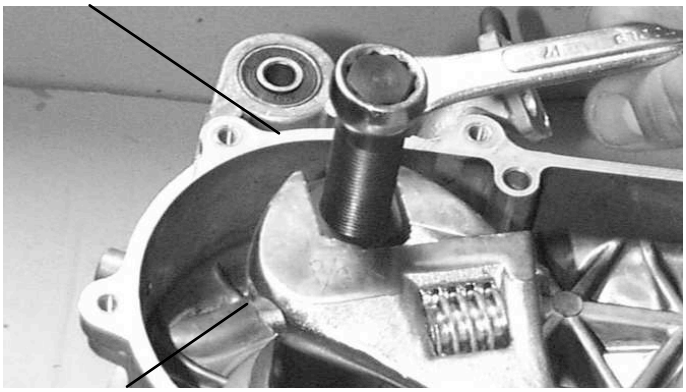
Drive a new crankshaft bearing into the left crankcase.

Bearing Outer Driver Handle A

Bearing Outer Driver, 42x47mm
Pilot, 20mm

Install the crankshaft into the left crankcase.

Crankcase Assembly Tool



Crankcase Assembly Collar

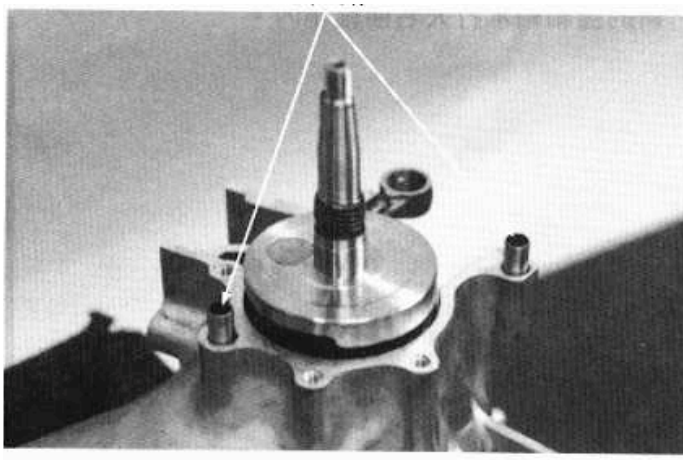
✱ Apply KYMCO ULTRA motor oil or molybdenum disulfide to the crankshaft bearings and connecting rod big end.

Apply grease to the lip of the oil seal and then install it.

CRANKCASE ASSEMBLY

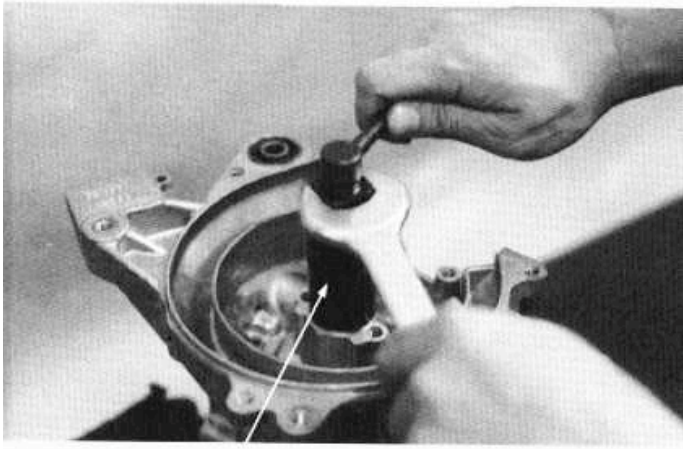
Install the dowel pins and a new gasket to the crankcase mating surface.

Dowel Pins



Assemble the crankcase halves.

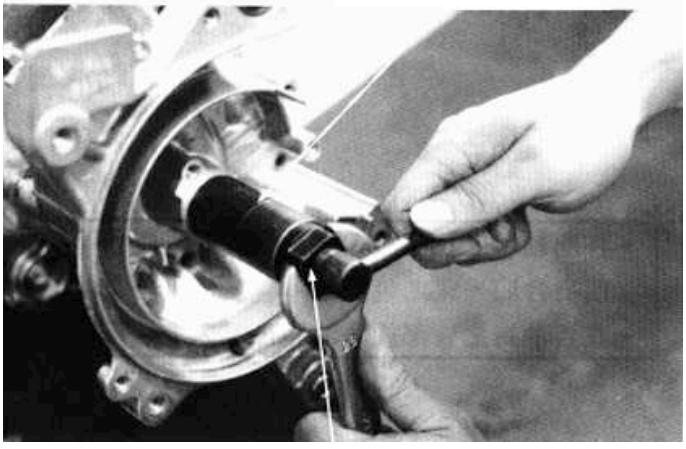
Crankcase Assembly Collar



Crankcase Assembly Tool

The distance between the right crankcase oil seal and crankcase surface is about 12.5±0.5 mm.

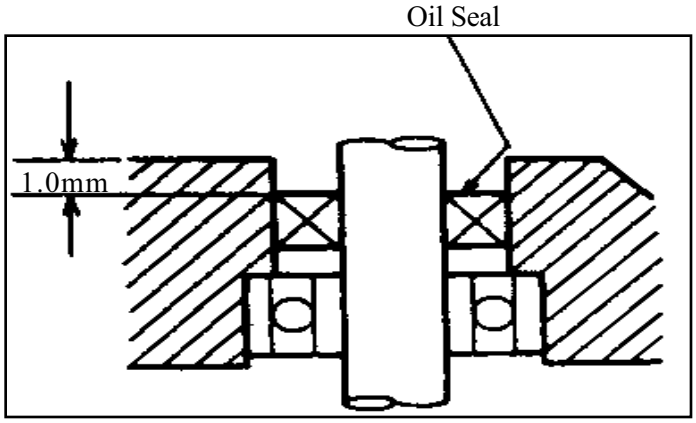
Crankcase Assembly Collar



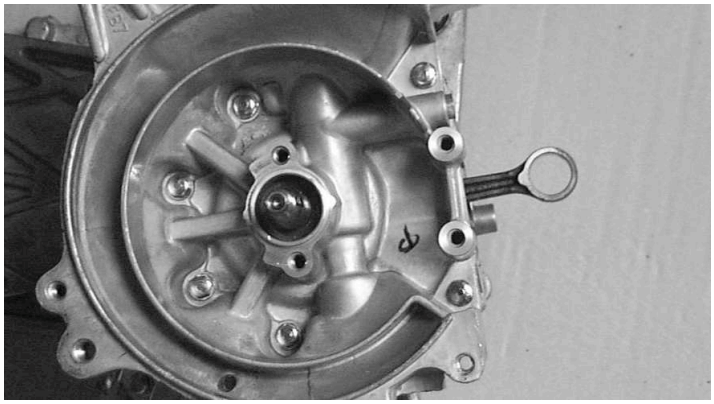
Crankcase Assembly Tool

✱ When installing the oil seal, be careful to press it with even force.

The distance between the left crankcase oil seal and crankcase surface is about 1.0mm.



Install and tighten the crankcase attaching bolts.



✱ After assembly, check the crankshaft for smooth operation.

CARBURETOR

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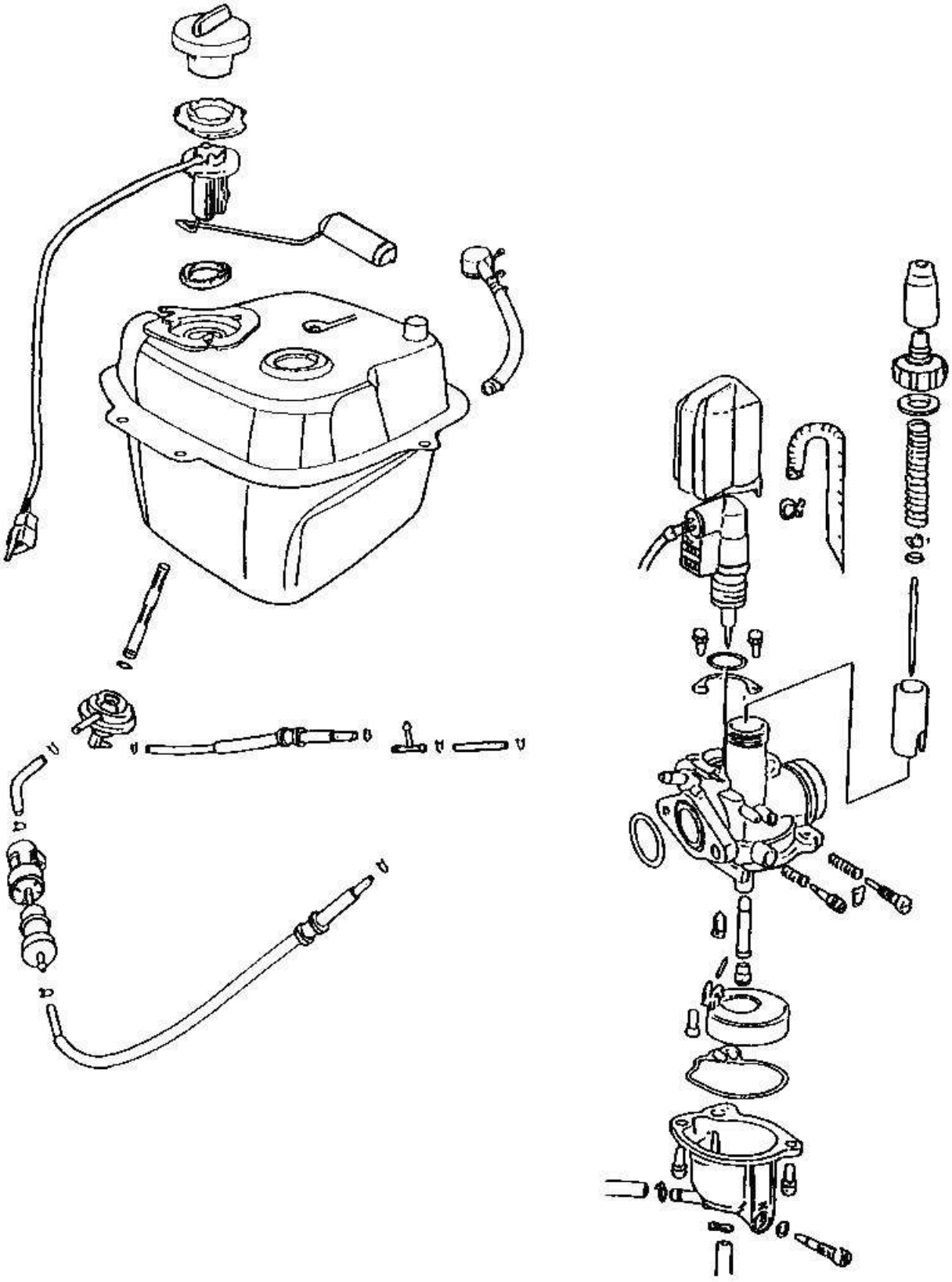
11. CARBURETOR



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- When working with gasoline, keep away from sparks and flames..
- Note the locations of O-rings when disassembling and replace them with new ones during assembly.
- All cables, fuel lines and wires must be routed and secured at correct locations.
- Bleed air from the oil lines whenever they are disconnected.

SPECIFICATIONS	BA10AB.AC.
Venturi dia.	14mm
Identification number	PB058A
Float level	8.6mm
Main jet	#85
Slow jet	#35
Air screw opening	1° ± Ω
Idle speed	2000±100rpm
Throttle grip free play	2_ 6mm

SPECIAL TOOL

Float level gauge

TROUBLESHOOTING

Engine does not start

- No fuel in tank
- Too much fuel getting to cylinder
- Clogged fuel filter
- Clogged air cleaner

Lean mixture

- Clogged fuel jets
- Clogged fuel cap vent
- Clogged fuel filter
- Bent, kinked or restricted fuel line
- Faulty float valve
- Float level too low
- Clogged air cleaner

Engine idles roughly, stalls or runs poorly

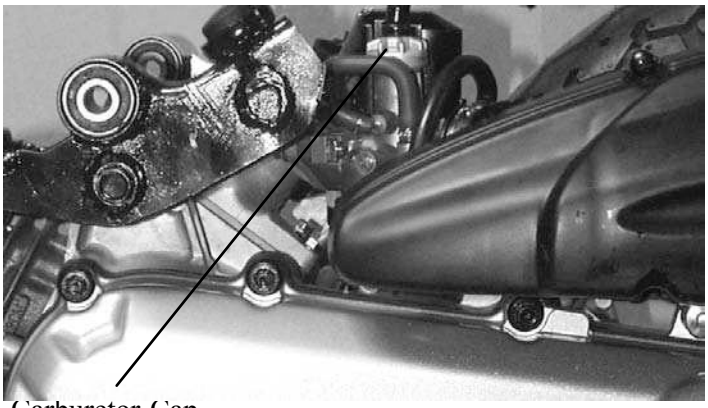
- Incorrect idle speed
- Ignition malfunction
- Compression too low
- Incorrectly adjusted air screw
- Incorrect float level
- Clogged air cleaner
- Intake air leaks
- Fuel contaminated
- Faulty reed valve
- Clogged fuel jets

Rich mixture

- Faulty float valve
- Float level too high
- Clogged air jets

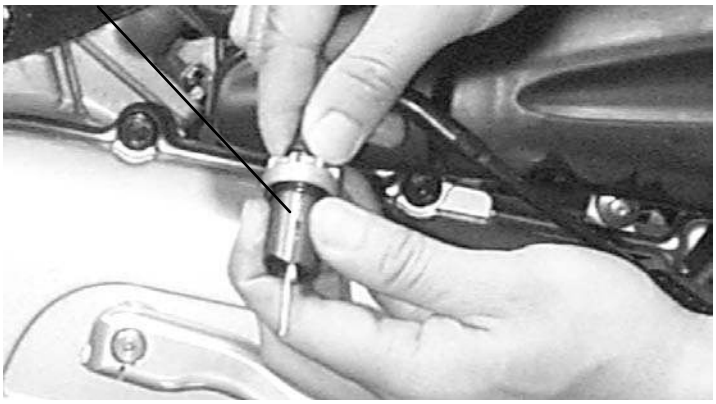
THROTTLE VALVE DIS-ASSEMBLY

Remove the rear carrier. (⇨12-5)
Remove the met-in box. (⇨12-4)
Loosen the carburetor cap and remove the throttle valve.


Carburetor Cap

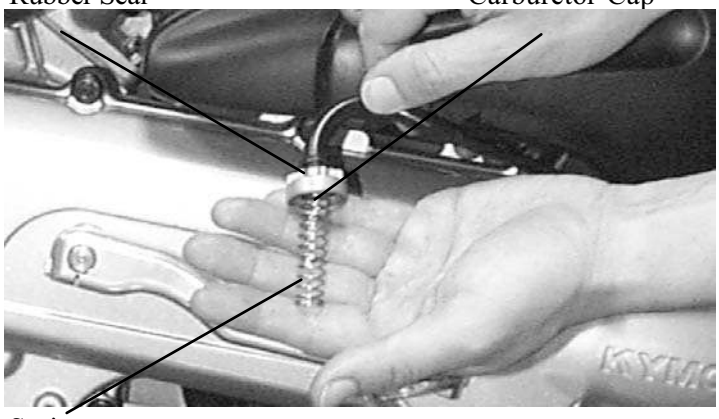
Disconnect the throttle cable from the throttle valve.

Throttle Valve

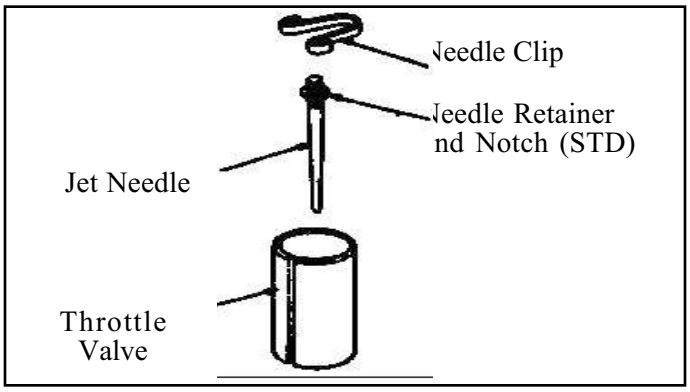


Remove the throttle valve spring, carburetor cap and rubber seal.

Rubber Seal Carburetor Cap


Spring

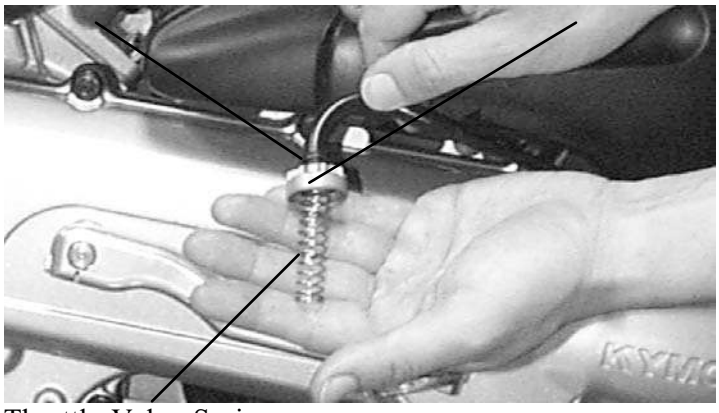
Remove the jet needle by removing the needle clip.
Check the jet needle and throttle valve for wear or damage.



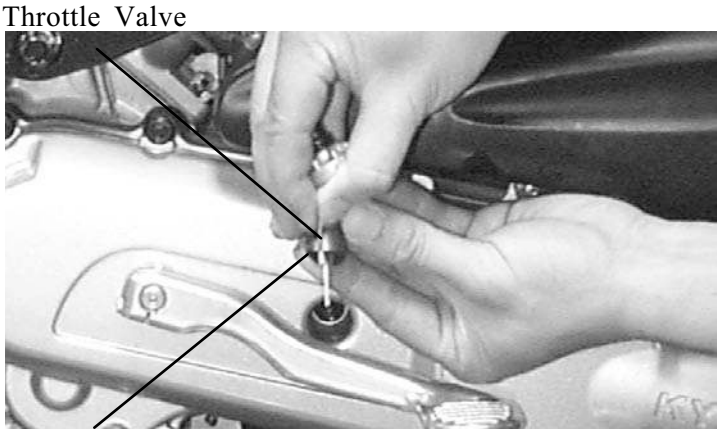
THROTTLE VALVE INSTALLATION

Install the jet needle on the throttle valve and secure with the needle clip.

Install the rubber seal on the throttle cable and then install the carburetor cap and throttle valve spring.



Connect the throttle cable to the throttle valve.



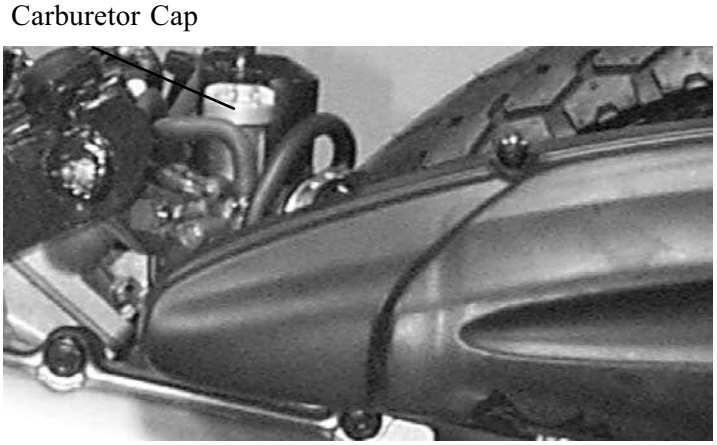
Install the throttle valve by aligning the groove in the throttle valve with the throttle stop screw.

Tighten the carburetor cap.
After installation, perform the following adjustments and inspections.

Throttle cable free play (⇨3-12)

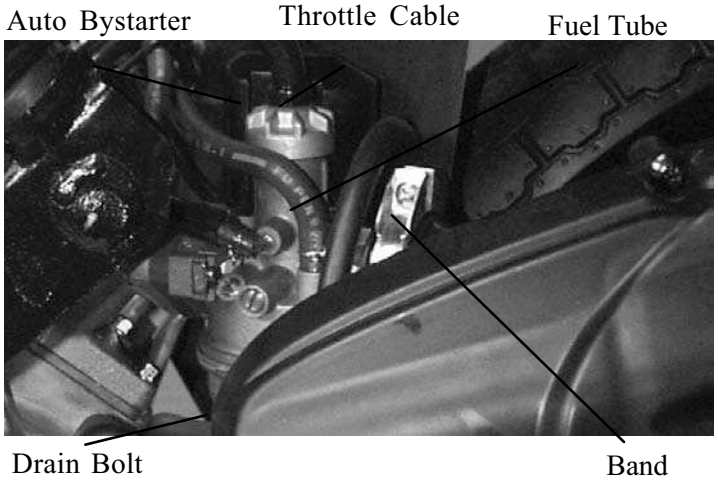
Idle speed adjustment (⇨3-11)

Install the met-in box.



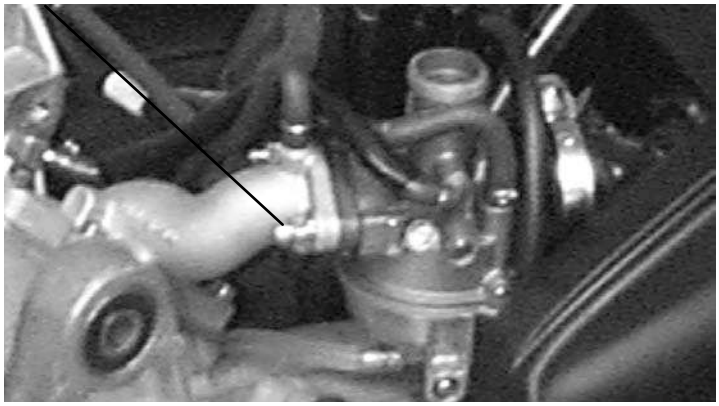
CARBURETOR REMOVAL

Remove the met-in box. (⇨12-4)
Remove the air cleaner by removing the air cleaner band screw and attaching bolts.
Disconnect the fuel tube.
Loosen the drain bolt to drain fuel from the carburetor.
Disconnect the auto bystarter wire connector.
Remove the two carburetor lock nuts.



Remove the carburetor.

Nut

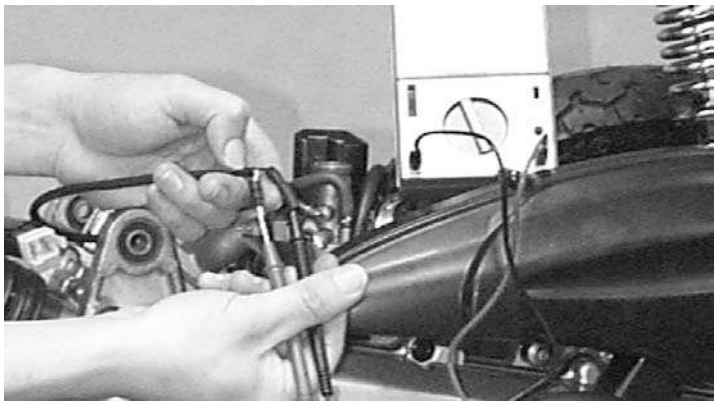


AUTO BYSTARTER

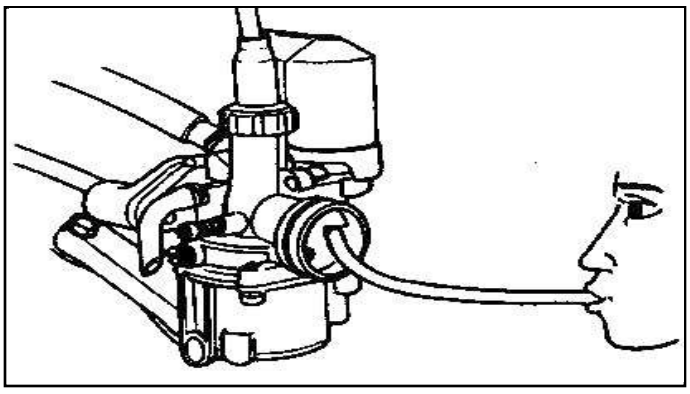
AUTO BYSTARTER INSPECTION

Measure the resistance between the auto bystarter wire terminals.
Resistance: 5Ω (10 minutes minimum after stopping the engine)

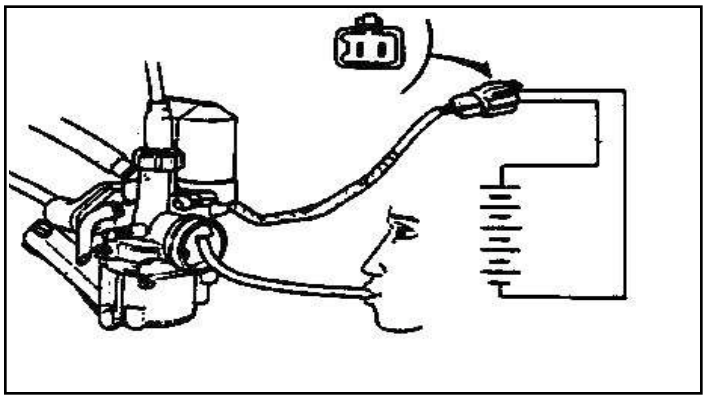
If the resistance exceeds 5Ω, replace the auto bystarter with a new one.



After the engine stops for 30 minutes, connect a hose to the fuel enriching circuit and blow the hose with mouth.
If air cannot be blown into the hose (clogged), the auto bystarter is faulty. Replace it with a new one.



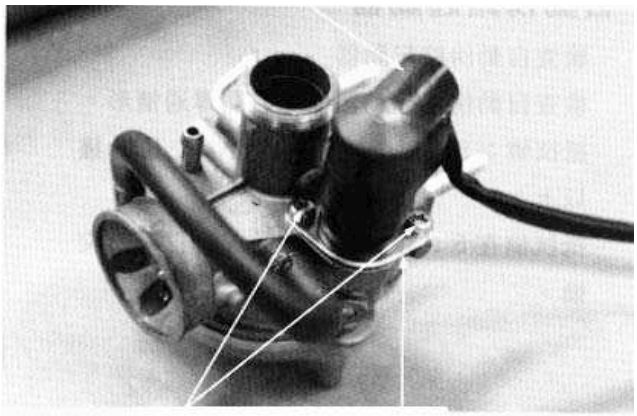
Connect the auto bystarter yellow wire to the battery positive (+) terminal and green/ black wire to the battery negative (-) terminal and wait 5 minutes.
Connect a hose to the fuel enriching circuit and blow the hose with mouth.
If air can be blown into the hose, the auto bystarter is faulty and replace it with a new one.



AUTO BYSTARTER REMOVAL

Remove the auto bystarter cover.
Remove the two auto bystarter set plate screws to remove the auto bystarter.

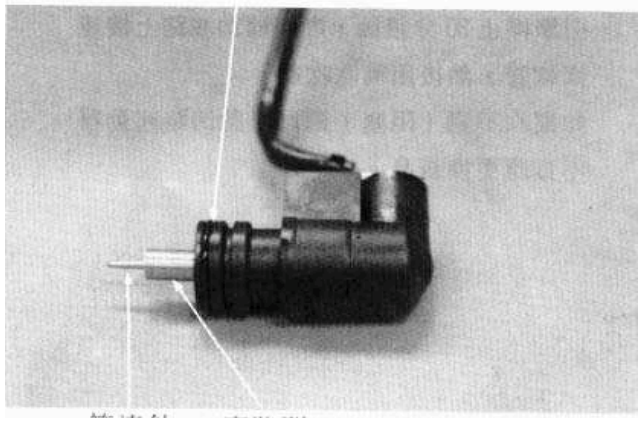
Auto Bystarter



Screws Set Plate

O-ring

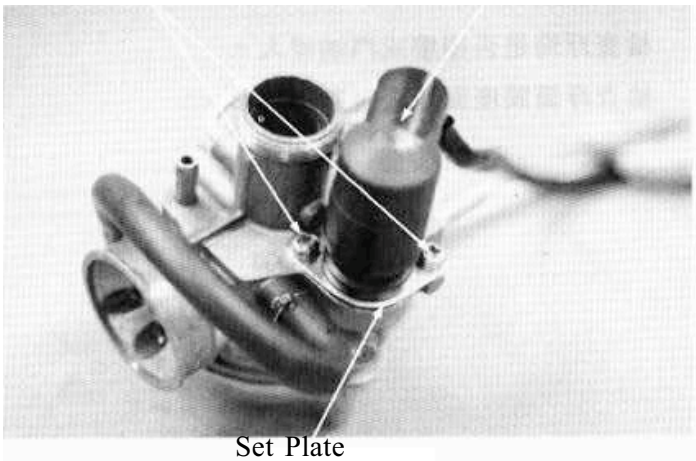
Check the auto bystarter valve and needle for wear or damage.
Check the O-ring for wear or damage.



Bystarter Needle Bystarter Valve

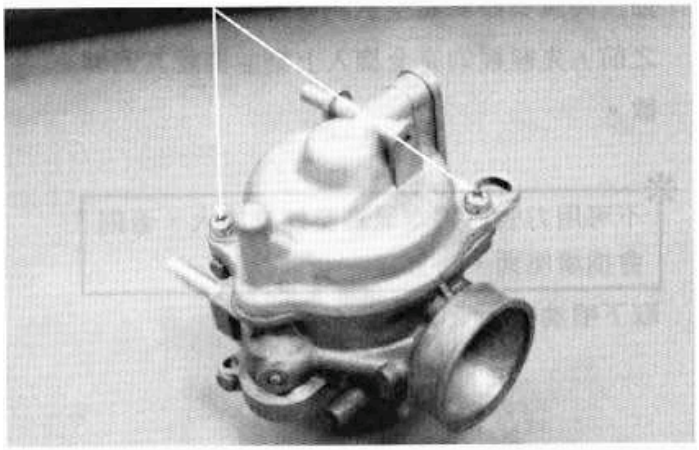
AUTO BYSTARTER INSTALLATION

Install the auto bystarter into the carburetor body until it bottoms..
Install the set plate and then tighten the two screws.

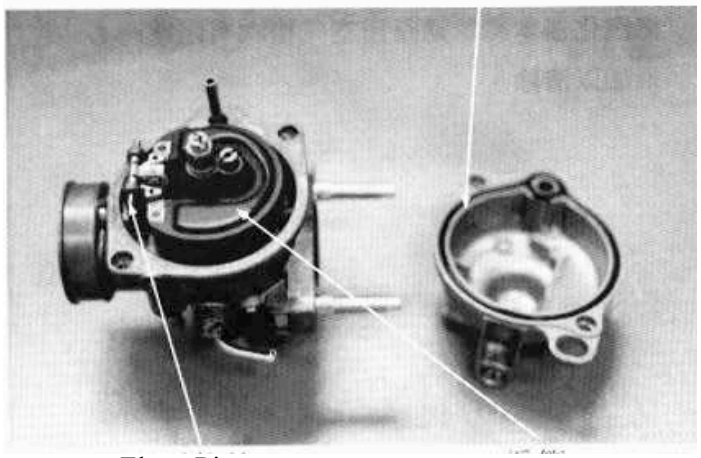


FLOAT CHAMBER

Remove the two float chamber screws and the float chamber.



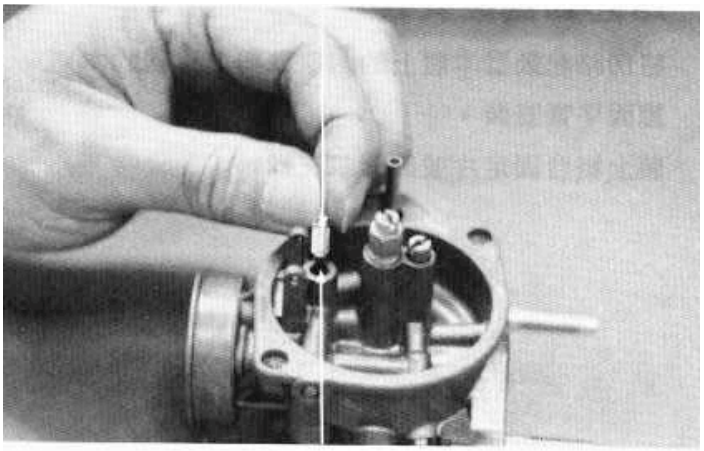
Remove the screw and O-ring.
Remove the float pin, float and float valve.



FLOAT/FLOAT VALVE INSPECTION

Inspect the float for damage or fuel inside the float.
Check the float valve seat for wear or damage.

Float Valve



Float Seat

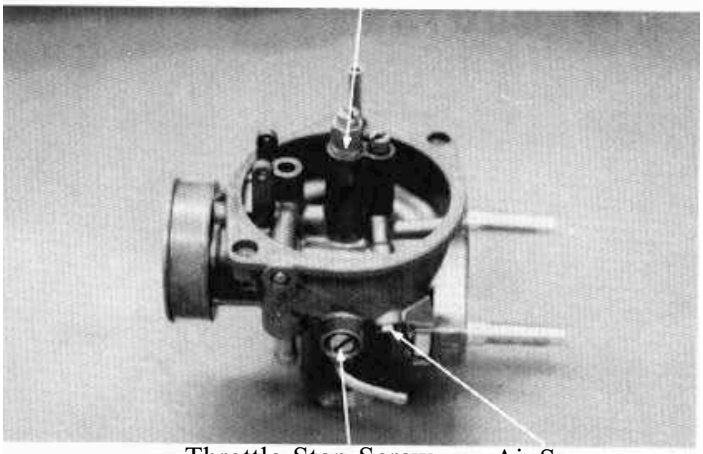
JETS/SCREWS REMOVAL

Before removing the throttle stop screw or air screw, record the number of rotations until it seats lightly. Then, remove them.

✱ Do not force the air screw against its seat to prevent damage.

Remove the main jet and needle jet holder.

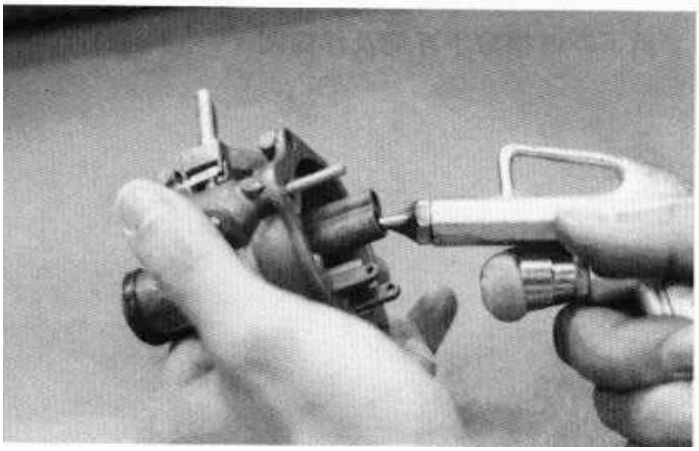
Main Jet



Throttle Stop Screw Air Screw

CARBURETOR PASSAGES CLEANING

Blow compressed air through all passages of the carburetor body with an air gun.



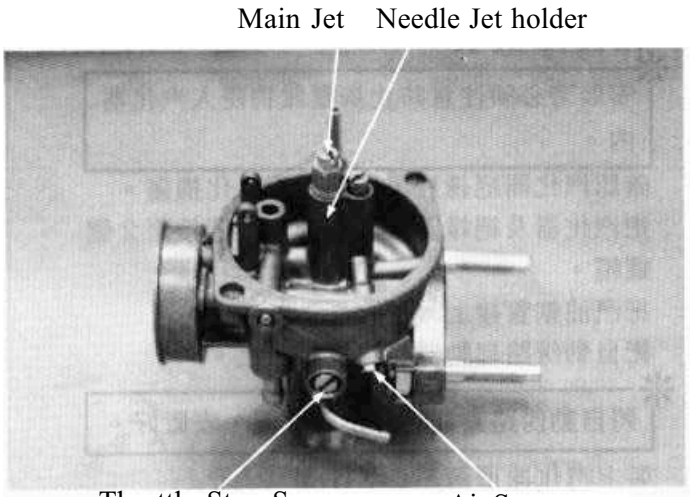
FLOAT CHAMBER ASSEMBLY

Install the main jet and needle jet holder.

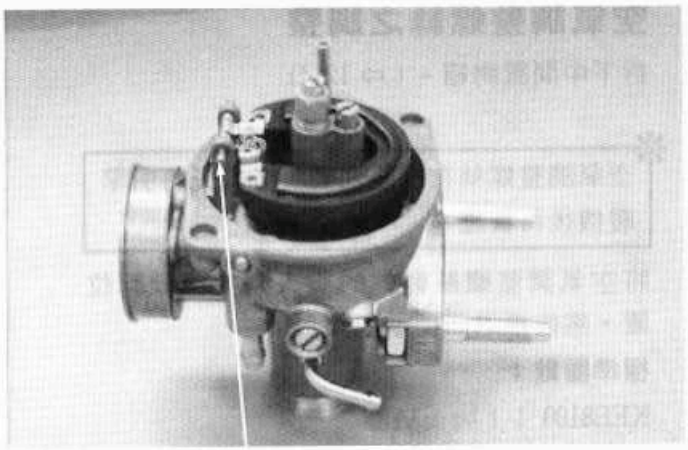
Install the air screw and throttle stop screw according to the rotations recorded.

✱

If the air screw must be replaced, be sure to perform the air screw adjustment again.



Install the float valve, float and float pin.
Tighten the float screw securely.

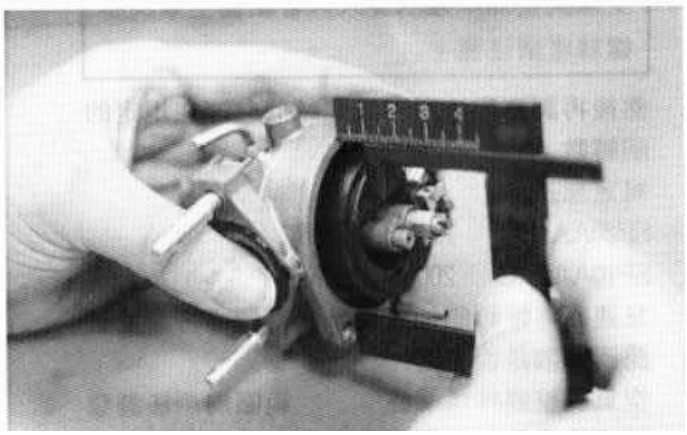


FLOAT LEVEL INSPECTION

Slightly tilt the carburetor and measure the float level with the float valve just connecting the float arm.

Float Level: 8.6mm

Replace the float if the level is out of the specified level range.
Install the O-ring.
Check the operation of the float and install the float chamber.
Tighten the screws.



CARBURETOR INSTALLATION

✱ When installation, do not allow foreign particles to enter the carburetor.

Check the carburetor insulator and O-ring for wear or damage.
Install the carburetor and insulator onto the intake manifold and tighten the two lock nuts.
Connect the fuel tube and auto bystarter wire connector.

✱ Route the auto bystarter wire correctly and properly.

Install the carburetor cap. (⇨11-4)
Install the air cleaner onto the carburetor and tighten the band screw.
Install the met-in box. (⇨12-4)

O-rings

Insulator

AIR SCREW ADJUSTMENT

Remove the met-in box. (⇨12-4)

✱ Warm up the engine before air screw adjustment.

Turn the air screw clockwise until it seats lightly and back it to the specification given.

Air Screw Opening:

BA10AB.AC.50: 1° ± Ω turns

Start the engine and turn the air screw in or out slowly to obtain the highest engine speed.

✱ Do not force the air screw against its seat to prevent damage.

Turn the throttle stop screw to obtain the specified idle speed.

Idle Speed:

BA10AB.AC.50 : 2000±100rpm

Slightly increase the engine speed and make sure that the engine does not miss or run erratic.
If the adjustment of the air screw within the range of ±Ω turn makes no difference to the engine performance, check other related items.

Carburetor Cap Band Air Cleaner Case

Fuel Tube

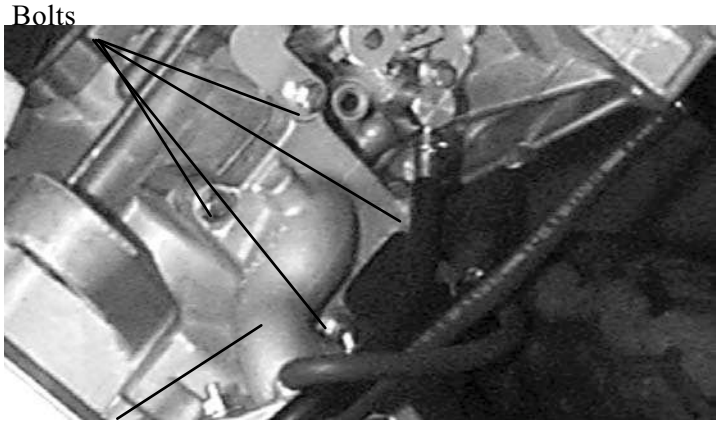
Air Screw

Throttle Stop Screw

REED VALVE

REMOVAL

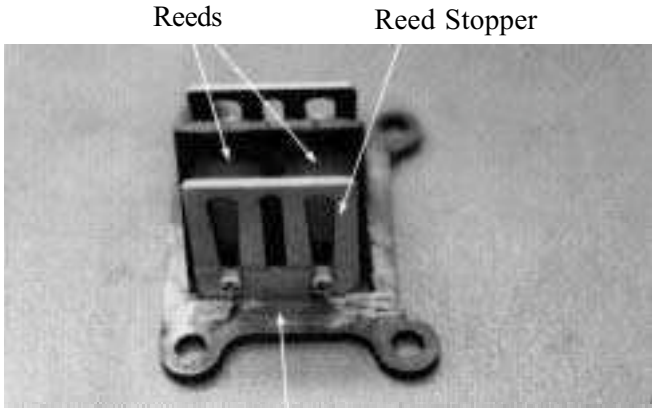
Remove the rear carrier.
Remove the frame body cover.
Remove the four intake manifold bolts and gasket.
Remove the reed valve and gasket.



INSPECTION

Check the reed valve for damaged or weak reeds.
Check the reed valve seat for cracks, damage or clearance between the seat and reed.
Replace the valve if necessary.

✱ Do not disassemble or bend the reed stopper. To do so can cause loss of engine power and engine damage. If any of the stopper, reed or valve seat is faulty, replace them as a unit.



INSTALLATION

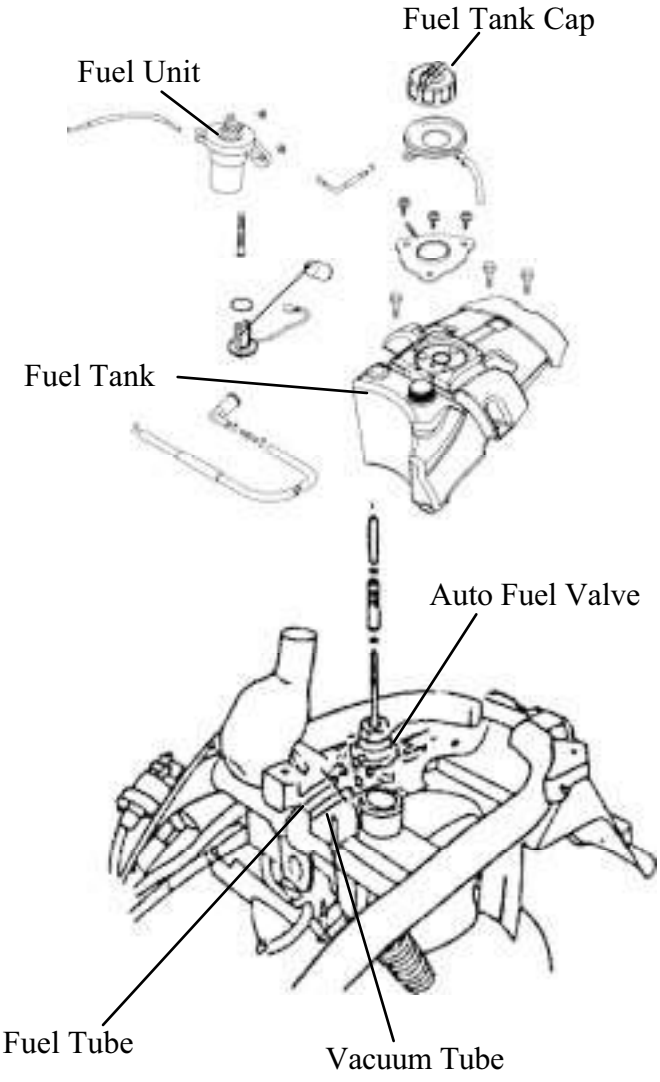
Install the reed valve in the reverse order of removal.

✱ Install a new gasket with the gasket indentation aligned with the reed valve.
After installation, check for intake air leaks.

FUEL TANK

REMOVAL

Remove the met-in box. (⇨12-4)
Remove the frame body cover. (⇨12-5)
Remove the rear carrier. (⇨12-5)
Disconnect the fuel tube and vacuum tube at the auto fuel valve.
Disconnect the fuel unit wire connector.
Remove the fuel tank mounting bolts and fuel tank.
Inspect the fuel unit. (⇨16-2)
Replace the fuel unit if necessary. (⇨16-2)



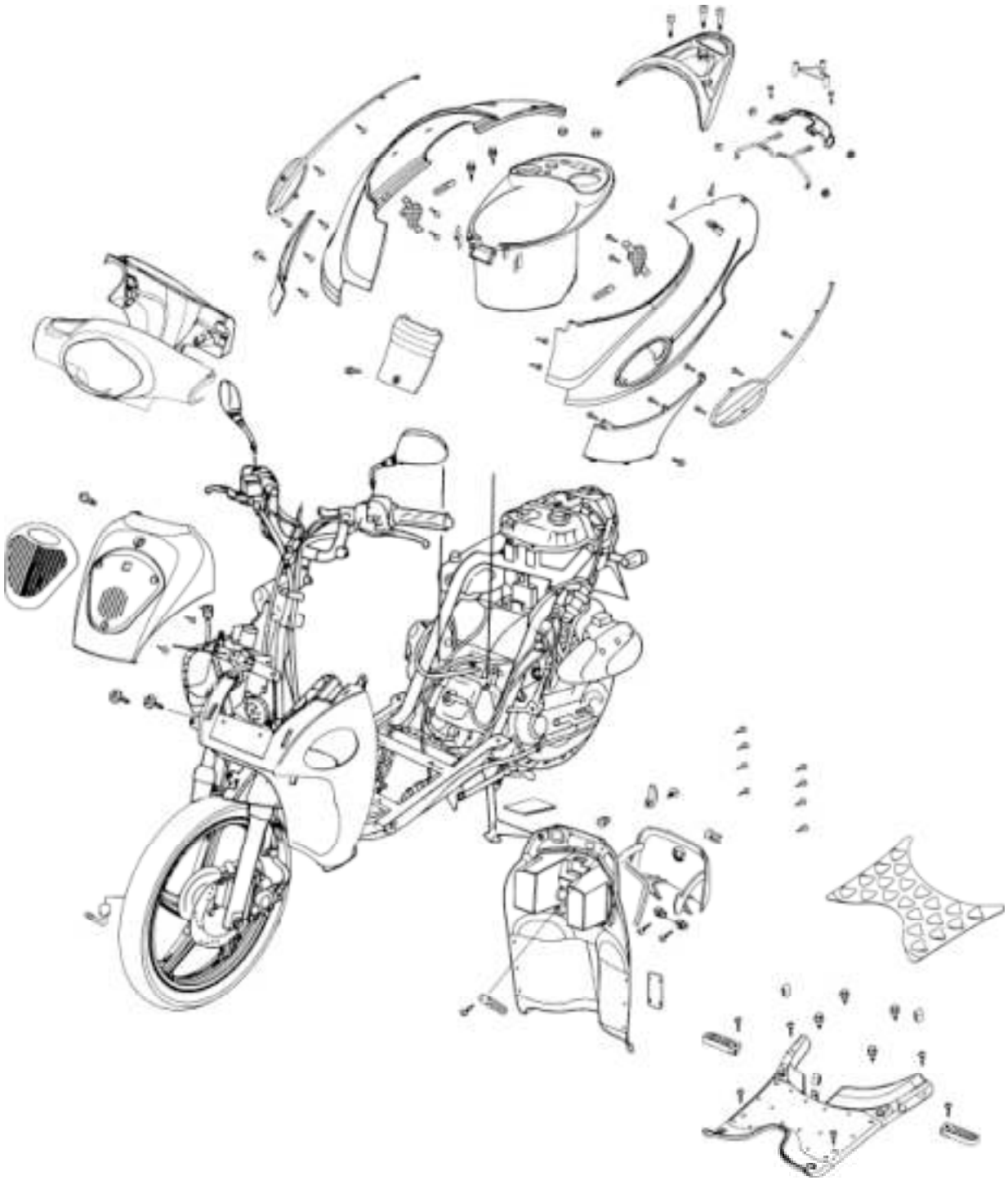
12

FRAME COVERS

SERVICE INFORMATION 12-2
FRAME COVERS REMOVAL/INSTALLATION 12-3

12. FRAME COVERS

ASSEMBLY DRAWING



SERVICE INFORMATION

When removing frame covers, use care not to pull them by force because the cover joint claws may be damaged.

Items Related for Removal

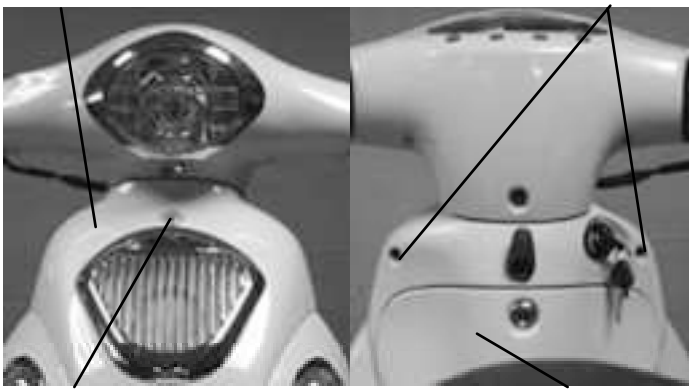
Handlebar front cover	———	Headlight wire
Front cover	———	
Handlebar rear cover	———	Speedometer cable and instrument light wire connectors, etc.
Frame body cover	———	Met-in box, rear carrier,rear fender.
Floor board	———	frame body cover.
Front tool box	———	Front cover, battery, floor board .

FRAME COVERS REMOVAL

FRONT COVER REMOVAL

Remove the screw the front cover.
Remove the two screws on the back of the front cover.
Push the two inside claws of the downside front cover to float the front cover.
Remove the front cover downward.
The installation sequence is the reverse of removal.

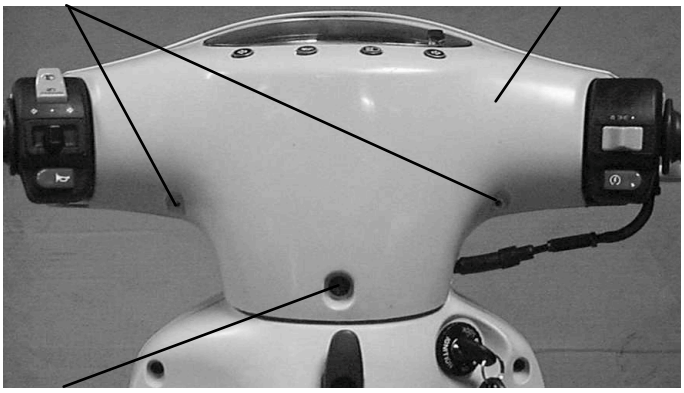
* During removal, be careful not to pull the joint claws forcibly.

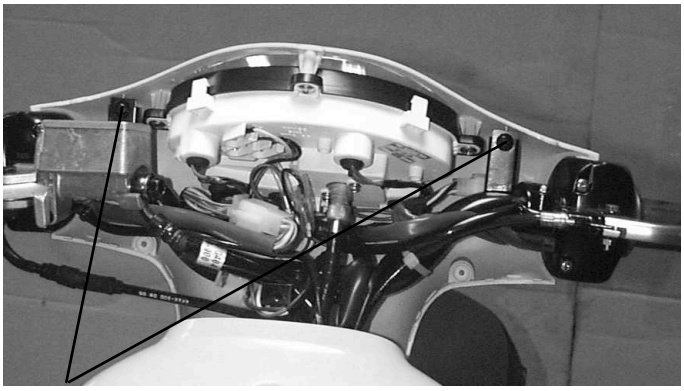


HANDLEBAR FRONT/REAR COVER REMOVAL

First remove the one screws attaching the handlebar front cover.
Remove the handlebar front cover.
Disconnect the headlight wire connector.

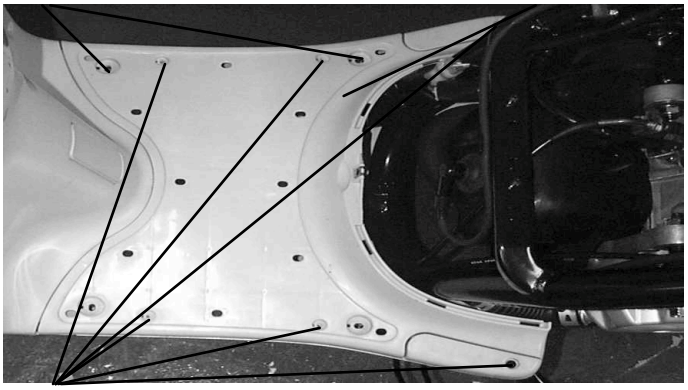
Remove the handlebar rear cover:
Remove the four screws and bolt attaching the handlebar rear cover.
Disconnect the speedometer cable and instrument light wire connectors.
Remove the handlebar rear cover.
The installation sequence is the reverse of removal.





FLOOR BOARD REMOVAL

Remove the rear carrier. (⇨12-5)
Remove the frame body cover. (⇨12-6)
Remove the front cover. (⇨12-3)
Remove the four bolts attaching and six screws the floor board to remove the floor board.
The installation sequence is the reverse of removal.



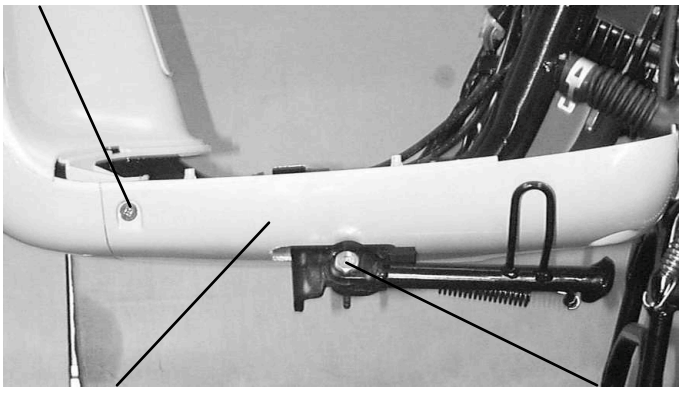
FRONT TOOL BOX REMOVAL

Remove the rear carrier. (⇨12-5)
Remove the frame body cover. (⇨12-6)
Remove the floor board. (⇨12-4)
Open the front tool box and remove the battery.
Remove the switch covers.
Remove the nut attaching and six screws the front tool box.
Remove the front tool box
The installation sequence is the reverse of removal.

✱ When removing the battery, first disconnect the battery negative (-) cable and then the positive (+) cable.
When taking the front tool box, pull them up and backward from downside not to damage the claws.

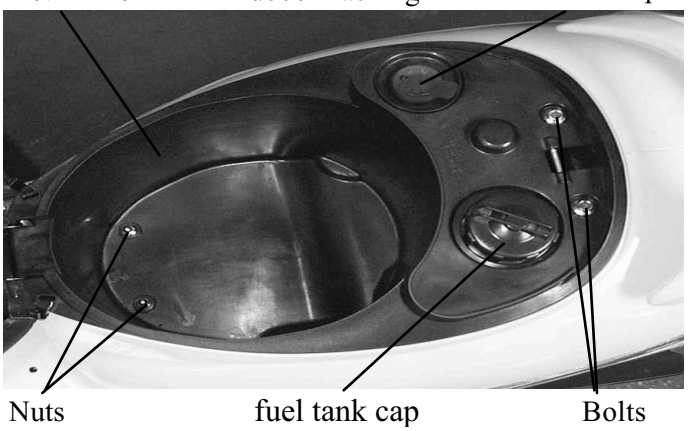
BOTTOM COVER REMOVAL

Remove the flood board. (⇨12-4)
Remove the three screws each side of the bottom cover.
Remove the bolt attaching the side stand.
Remove the bottom cover.
The installation sequence is the reverse of removal.



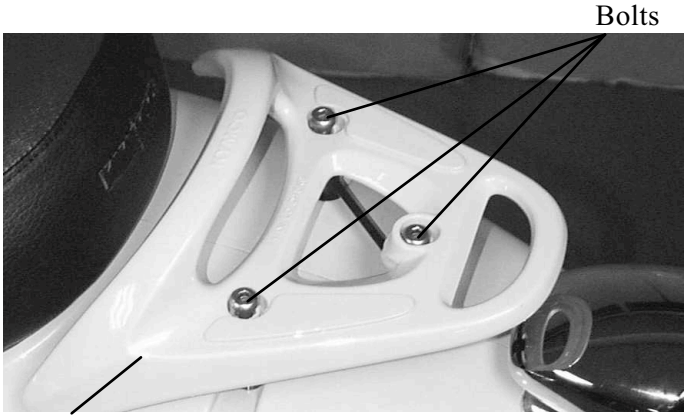
MET-IN BOX REMOVAL:

Open the seat.
Remove the two bolts, two nuts attaching the met-in box.
Remove the oil tank cap, rubber packing and fuel tank cap.
Remove the met-in box.
The installation sequence is the reverse of removal .



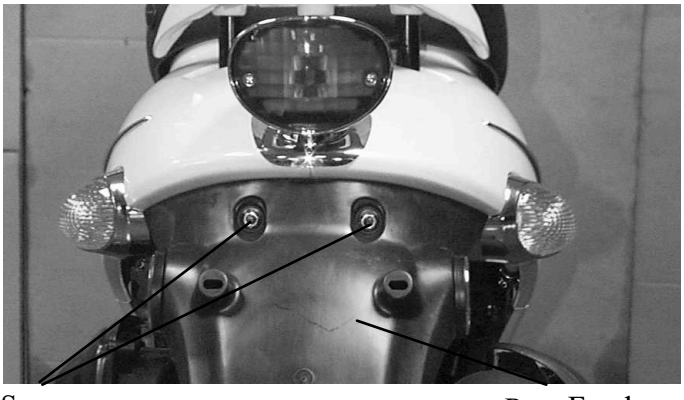
REAR CARRIER REMOVAL

Remove the three bolts attaching the rear carrier.
Remove the rear carrier.
The installation sequence is the reverse of removal.



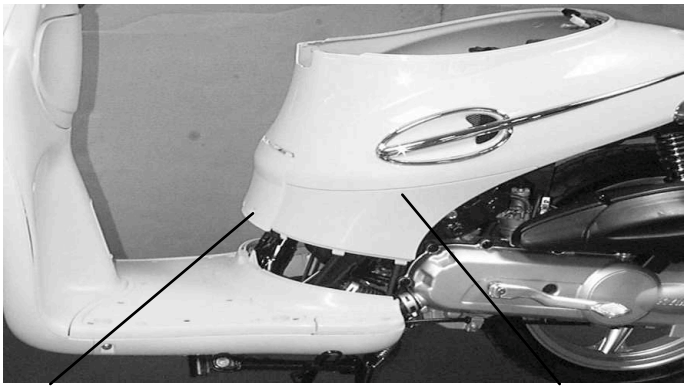
REAR FENDER REMOVAL

Remove the two screws the rear fender.
Remove the rear fender.
The installation sequence is the reverse of removal.



FRAME BODY COVER REMOVAL

Remove the rear carrier. (⇨12-5)
Remove the rear fender. (⇨12-5)
Remove the met-in box. (⇨12-4)
Remove the rear brake cable.
Remove the bolt attaching the front center cover of the frame body cover.
Remove the frame body cover.
The installation sequence is the reverse of removal.

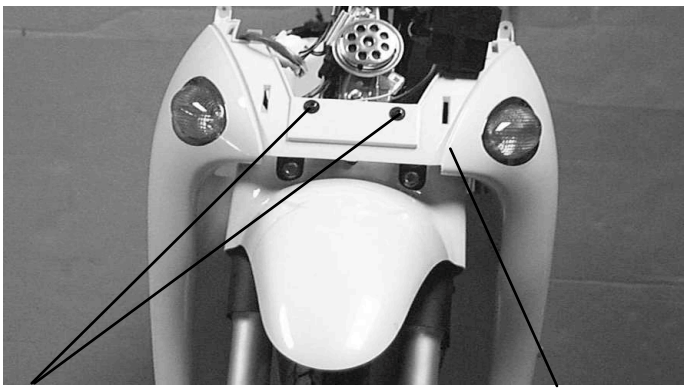


FRONT FENDER REMOVAL

Remove the floor board. (⇨12-4)
Remove the front tool box.(⇨12-4)
Remove the handlebar. (⇨13-3)
Remove the front fork. (⇨13-19)
Remove two bolts attaching each side of the front fender.
Remove the front fender.
The installation sequence is the reverse of removal.

FRONT LOWER COVERS REMOVAL

Remove the rear brake cable.
Remove the frame body cover. (⇨12-5)
Remove the front tool box.(⇨12-4)
Remove the handlebar. (⇨13-3)
Remove the front fork. (⇨13-19)
First remove the front cover. (⇨12-3)
Remove the right and left bottom cover removing the two screws for each rail.
Remove the two bolts attaching each of the right and left front lower covers.
Remove the front lower covers.
The installation sequence is the reverse of removal.



13

STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

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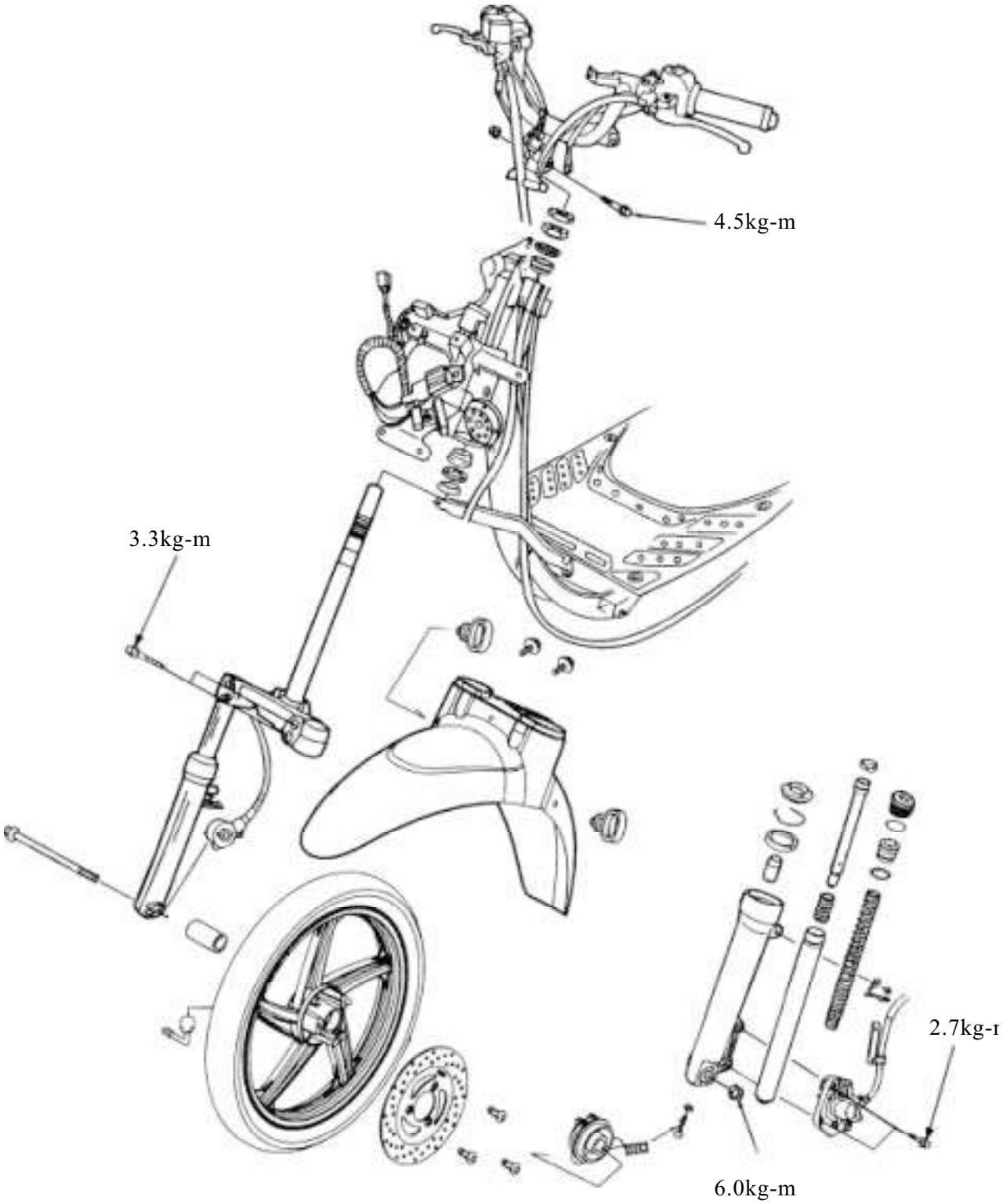
STEERING HANDLEBAR 13- 3
FRONT WHEEL 13- 5
FRONT BRAKE (DRUM BRAKE) 13- 9
FRONT BRAKE (DISK BRAKE) 13-12
FRONT SHOCK ABSORBER 13-20
FRONT FORK 13-23

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



SERVICE INFORMATION

SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)
Axle shaft runout		—	0.2
Front wheel rim runout	Radial	—	2.0
	Axial	—	2.0
Front shock absorber spring free length		200	182.8
Brake disk thickness		35_ 3.8	3.0
Brake disk runout		—	0.30
Brake master cylinder I.D.		12.700_ 12.743	12.75
Brake master cylinder piston O.D.		12.657_ 12.684	12.64
Brake caliper piston O.D.		25.400_ 25.405	25.45
Brake caliper piston I.D.		25.318_ 25.368	25.30

TORQUE VALUES

Handlebar lock nut	4.0_	5.0kg-m	Front damper nut	1.5_	3.0kg-m
Steering stem lock nut	8.0_	12.0kg-m	Front axle nut	5.0_	7.0kg-m
Steering top cone race	0.5_	1.3kg-m	Brake arm bolt	0.4_	0.7kg-m

SPECIAL TOOLS

Lock nut wrench
Lock nut socket wrench
Outer driver, 28x30mm
Rear shock absorber remover
Rear shock absorber compressor
Ball race remover
Driver handle A
Outer driver, 37x40mm
Pilot, 10mm
Bearing puller
Snap ring pliers (close)
Damper compressor

TROUBLESHOOTING

Hard steering (heavy)
- Excessively tightened steering stem top cone race
- Broken steering balls
- Insufficient tire pressure

Steers to one side or does not track straight
- Broken clutch weight spring
- Bent front fork
- Bent front axle or uneven tire

Poor brake performance
- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake cam
- Worn brake drum
- Poorly connected brake arm

Poor brake performance (disk brake)
- Air in brake system
- Deteriorated brake fluid
- Contaminated brake disk or disk pad
- Worn brake bushing
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

Front wheel wobbling
- Bent rim
- Loose front axle
- Bent spoke plate
- Faulty tire
- Improperly tightened axle nut

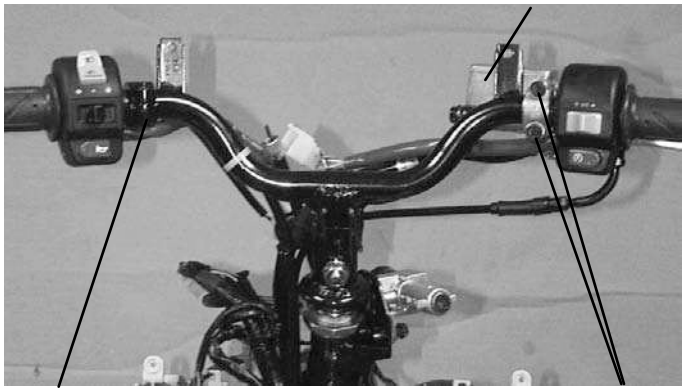
Soft front shock absorber
- Weak shock springs
- Insufficient damper oil

Front shock absorber noise
- Slider bending
- Loose fork fasteners
- Lack of lubrication

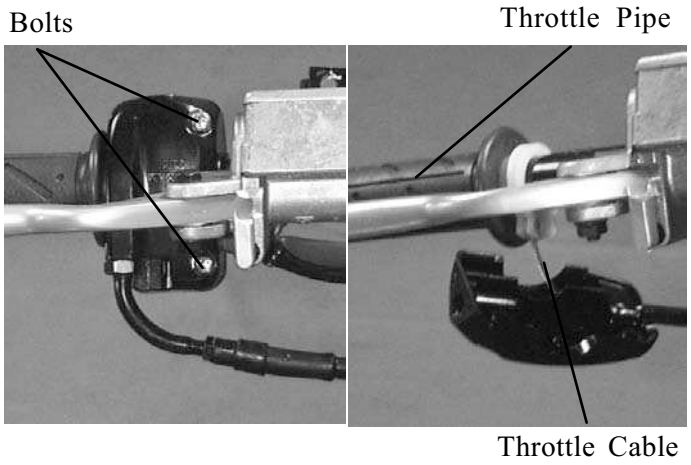
STEERING HANDLEBAR

REMOVAL

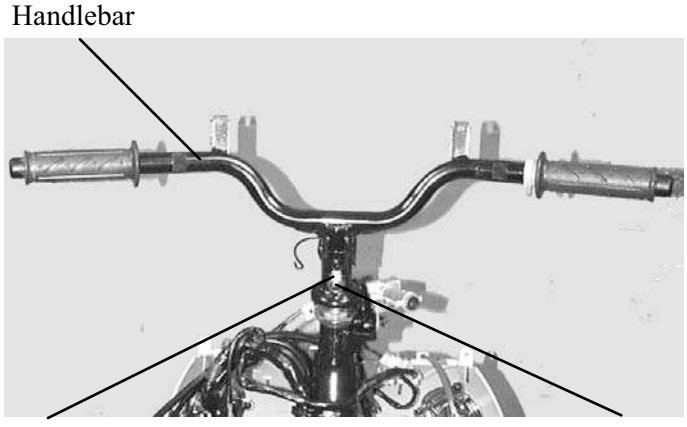
Remove the handlebar front and rear covers. (⇨12-3)
Remove two bolts attaching the left brake lever holder.
Remove two bolts attaching the brake master cylinder (disk brake) to the right brake lever.



Remove the two right handlebar switch housing bolts and separate the housing.
Disconnect the throttle cable and then remove the throttle pipe from the handlebar.



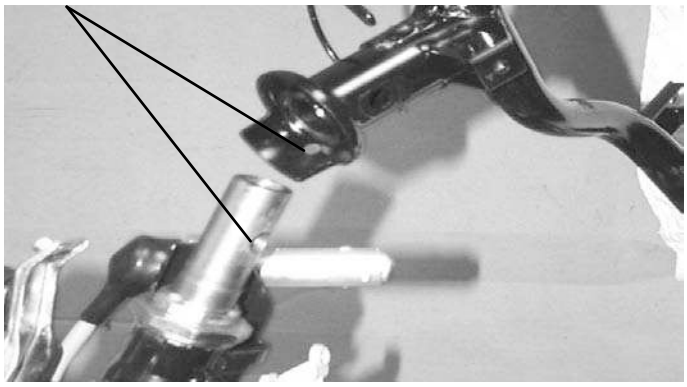
Remove the handlebar lock nut to remove the handlebar.



INSTALLATION

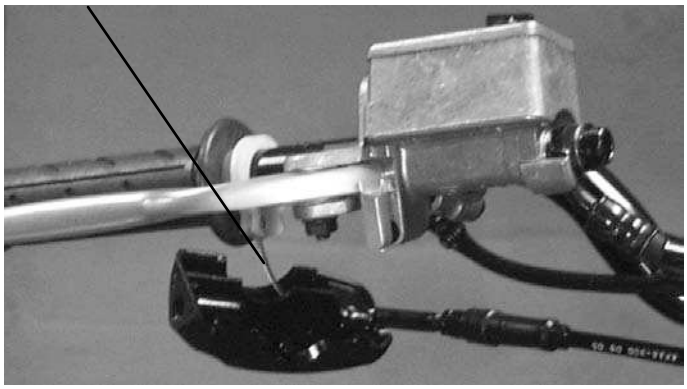
Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem.
Install and tighten the handlebar lock nut.
Torque: 4.5_ 5.0kg-m

Tab/Groove



Lubricate the throttle pipe front end with grease.
Install the throttle grip and connect the throttle cable.

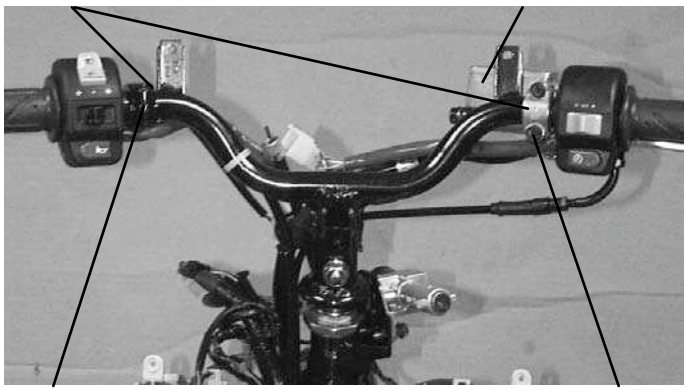
Throttle Cable



The installation sequence is the reverse of removal.
Install the rear brake lever holder.
Install the front brake master cylinder (disk brake).

Holders

Brake Master Cylinder



Bolts

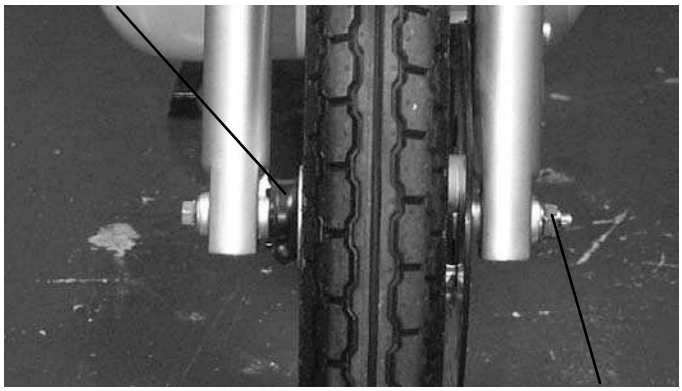
Bolts

FRONT WHEEL

REMOVAL

(DISK BRAKE)

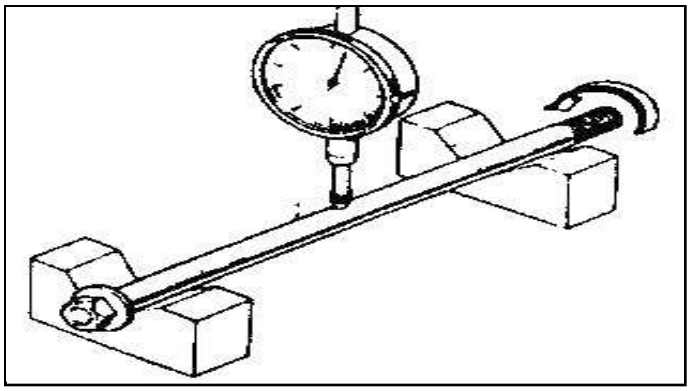
Jack the motorcycle front wheel off the ground.
Remove the speedometer cable set screw and disconnect the speedometer cable.
Remove the front axle nut and pull out the axle.
Remove the front wheel.
Remove the brake panel side collar.



INSPECTION

Set the axle in V blocks and measure the runout.
The actual runout is _ of the total indicator reading.

Service Limit: 0.2mm replace if over.

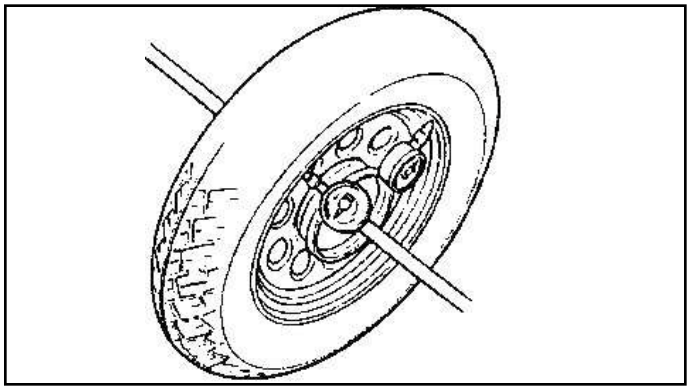


Check the wheel rim runout.

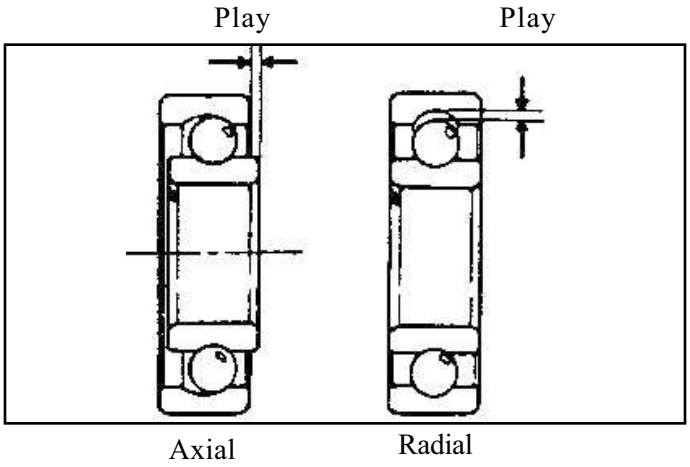
Service Limits:

Radial:2.0mm replace if over

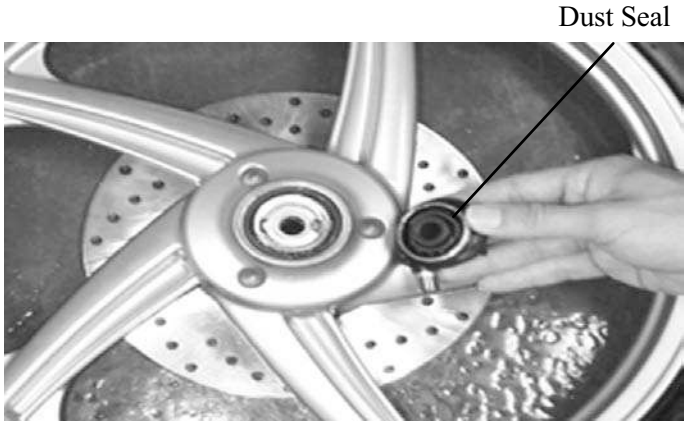
Axial:2.0mm replace if over



Turn the wheel bearings and replace them if they have excessive play or noise.

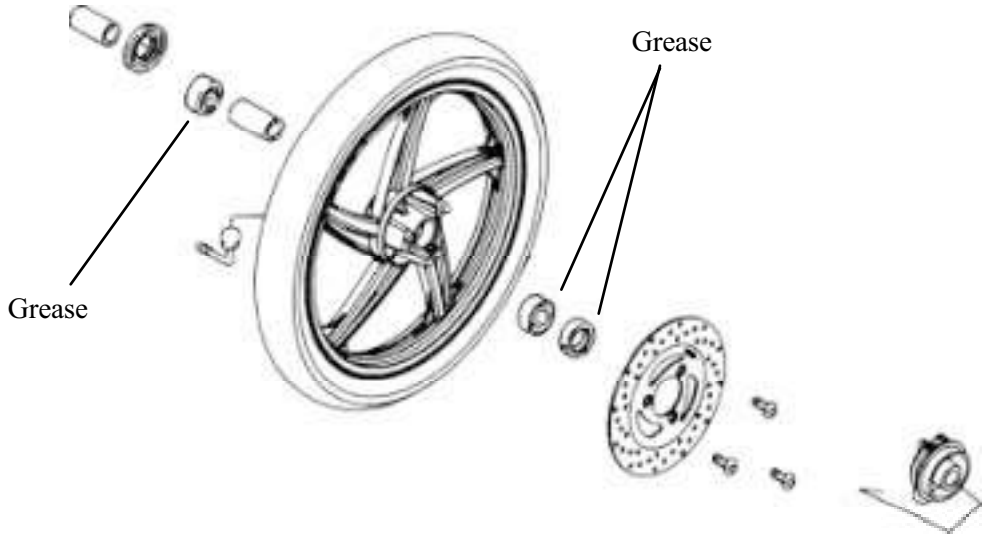


DISASSEMBLY
Remove the dust seal.



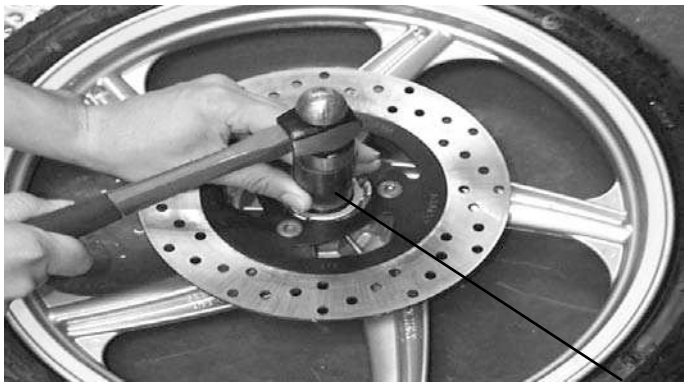
Remove the wheel bearings and distance collar.

ASSEMBLY

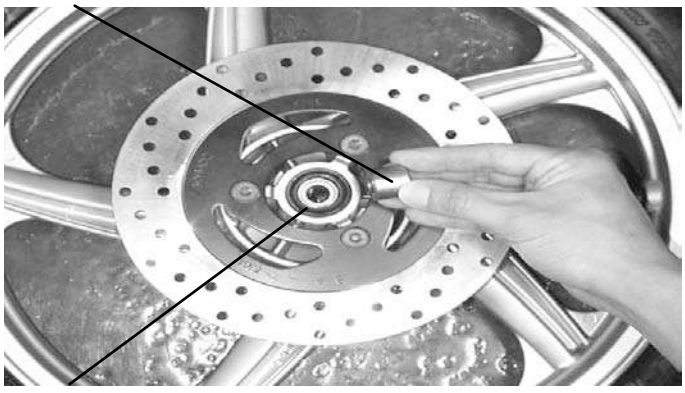


Pack all bearing cavities with grease.
Drive in the left bearing .
Install the distance collar.
Drive in the right bearing.

✱ Drive the bearing squarely with the sealed end facing out.

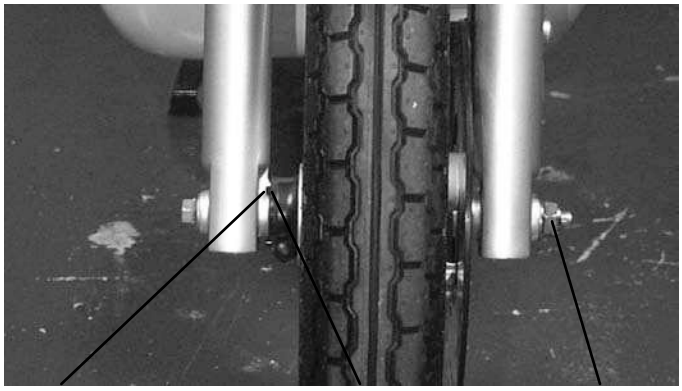


Apply grease to the dust seal lip and install the dust seal.
Install the side collar.



FRONT WHEEL INSTALLATION
(Disk Brake)

Install the front wheel, aligning the speedometer gear tab with the front fork groove.
Connect the speedometer cable.
Torque: 5.0_ 7.0kg-m

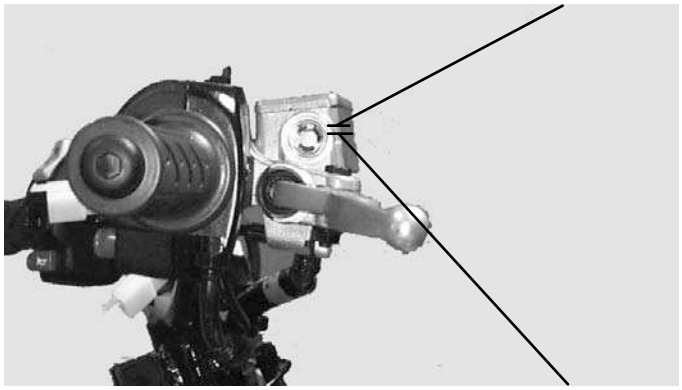


HYDRAULIC BRAKE (FRONT BRAKE)

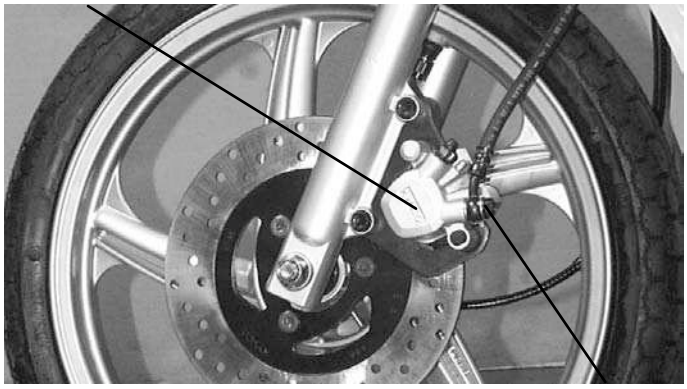
Brake Fluid Replacement/Air Bleeding

Check the brake fluid level on level ground.

✱
When operating the brake lever, the brake reservoir cap must be tightened securely to avoid spill of brake fluid.
When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage caused by spill of brake fluid.



Front Brake Caliper



Brake Fluid Bleeding

In order to avoid spill of brake fluid, connect a transparent hose to the bleed valve.

Warning

Brake fluid spilled on brake pads or brake disk will reduce the braking effect. Clean the brake pads and brake disk with a high quality brake degreaser.

Fully apply the brake lever and then loosen the brake caliper bleed valve to drain the brake fluid until there is no air bubbles in the brake fluid. Then, tighten the bleed valve. Repeat these steps until the brake system is free of air.

Brake Fluid Refilling

Add DOT-3 brake fluid to the brake reservoir.

✱
When bleeding, be careful not to allow air in the brake reservoir flowing into the brake system.
When using a brake bleeder, follow the manufacturer's instructions.
Never use dirty or unspecified brake fluid or mix different brake fluids because it will damage the brake system.

Make sure to bleed air from the brake system.

Brake Pad/Disk Replacement

✱ The brake pads must be replaced as a set to ensure the balance of the brake disk.

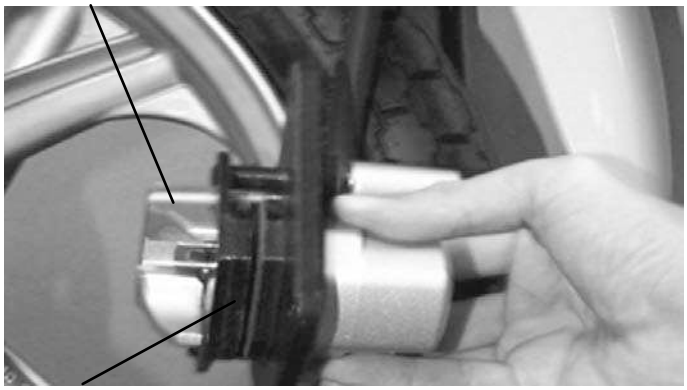
Remove the two bolts attaching the brake caliper.
Remove the brake caliper.
Remove the brake pads.

Front Brake Caliper

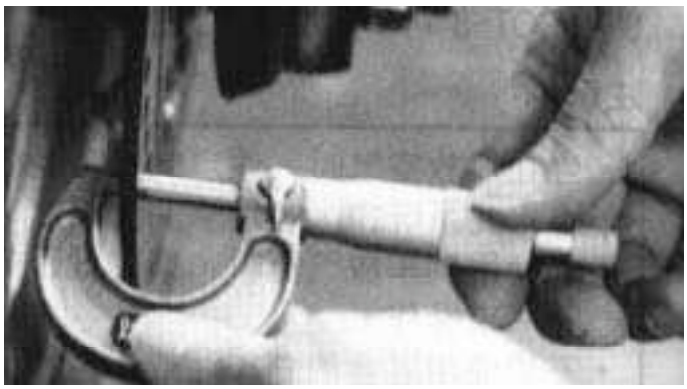
Install the brake pads in the reverse order of removal.
Torque: 1.5_ 2.0kg-m

✱ Keep grease or oil off the brake pads to avoid brake failure.

Front Brake Caliper


Brake Pads

Brake Disk
Measure the brake disk thickness.
Service Limit: 3.0mm
Measure the brake disk runout.
Service Limit: 0.3mm



BRAKE MASTER CYLINDER

Removal

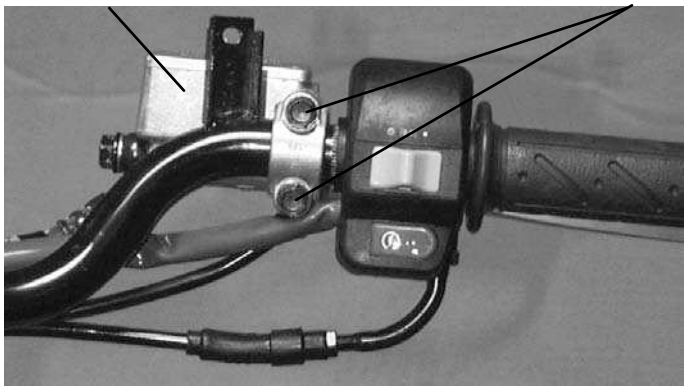
First drain the brake fluid from the hydraulic brake system.

✱

When servicing the brake system, use shop towels to cover rubber and plastic parts and coated surfaces to avoid being contaminated by brake fluid.

When removing the brake fluid pipe bolt, be sure to plug the pipe to avoid brake fluid leakage.

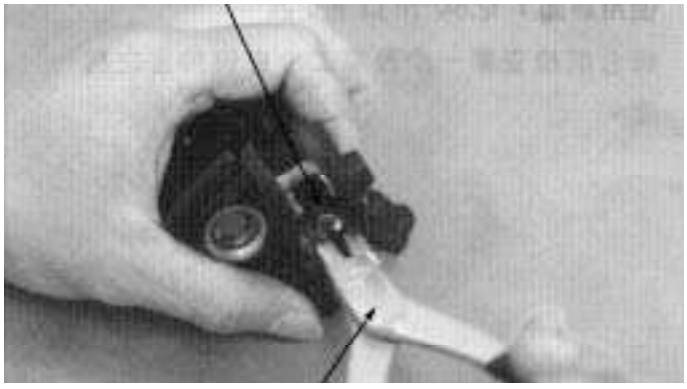
Brake Master Cylinder Bolts



Disassembly

Remove the piston rubber cover and snap ring from the brake master cylinder.

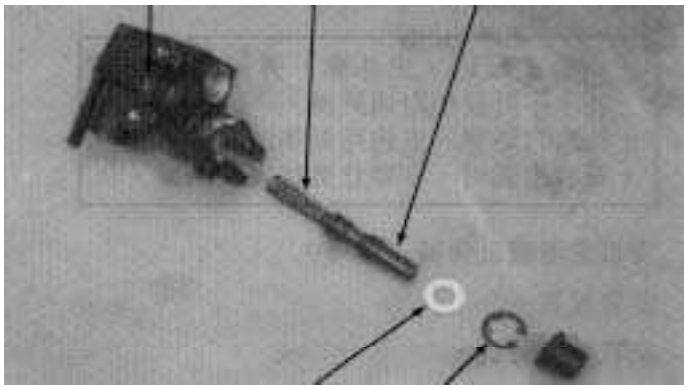
Snap Ring



Snap Ring Pliers (close)

Remove the washer, main piston and spring from the brake master cylinder.
Clean the inside of the master cylinder and brake reservoir with brake fluid.

Master Cylinder Spring Main Piston



Washer Snap Ring

Inspection

Measure the brake master cylinder I.D.

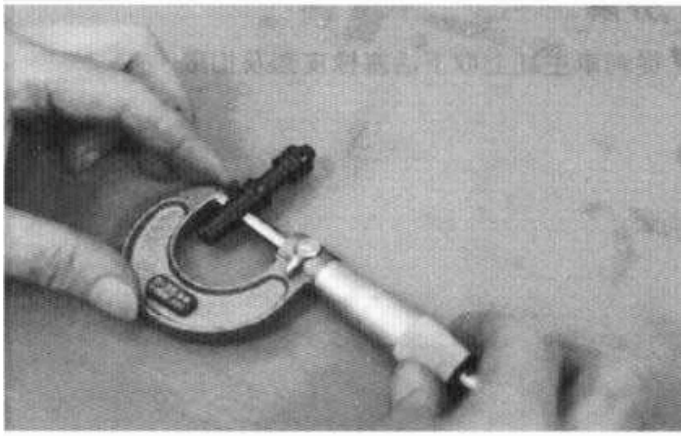
Service Limit: 12.75mm

Inspect the master cylinder for scratch or crack.

Measure the brake master cylinder piston O.D.

Service Limit: 12.6mm

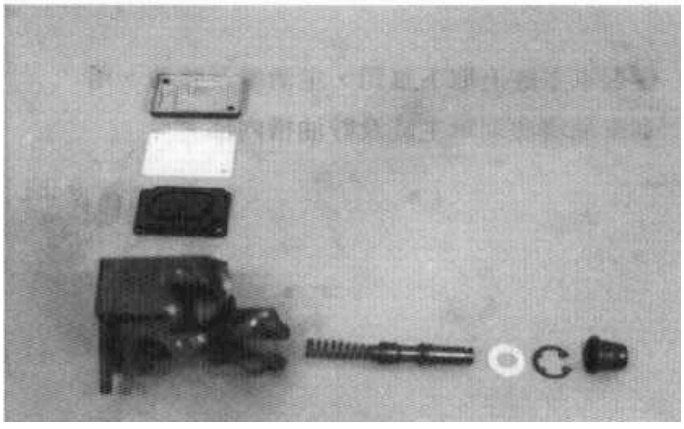
Before assembly, inspect the lst and 2nd rubber cups for wear.



Assembly

Before assembly, apply brake fluid to all removed parts.

Install the spring together with the 1st rubber cup.



* During assembly, the main piston and spring must be installed as a unit without exchange.
  When assembling the piston, soak the cups in brake fluid for a while.
  Install the cups with the cup lips facing the correct direction.

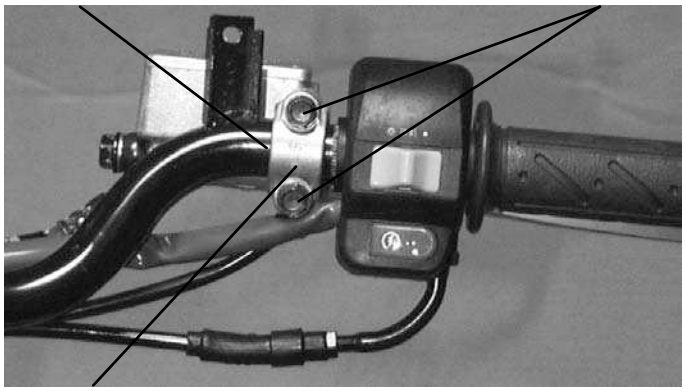
Install the main piston, spring and snap ring.

Install the rubber cover.

Install the brake lever.

Place the brake master cylinder on the handlebar and install the holder with "up" mark facing up. Be sure to align the punch mark with the holder joint.
First tighten the upper bolt and then tighten the lower bolt.

Torque: 1.0_ 1.4kg-m



Install the brake fluid pipe with the attaching bolt and two sealing washers.

Install the handlebar covers. (⇨12-3)
Fill the brake reservoir with recommended brake fluid to the upper limit and bleed air according to the method stated in 13-12.

BRAKE CALIPER (FRONT)

Removal

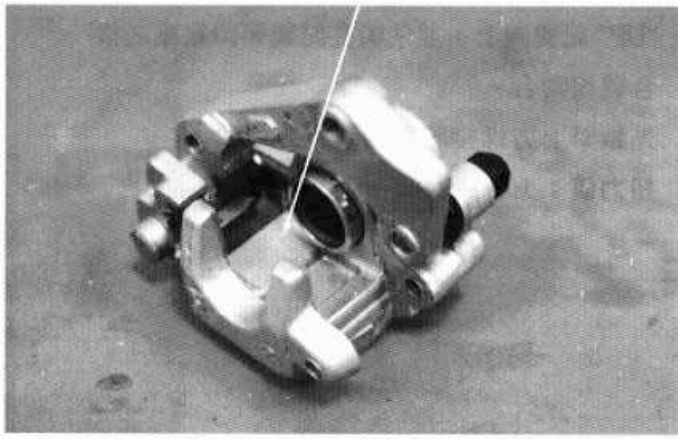
Remove the brake caliper. (⇨13-13)
Place a clean container under the brake caliper and disconnect the brake fluid pipe from the caliper.

✱ Do not spill brake fluid on any coated surfaces.

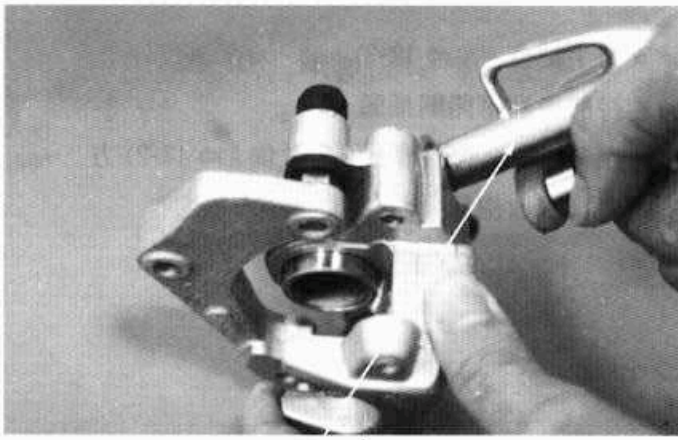
Disassembly

Remove the brake caliper seat from the brake caliper.

Brake Caliper Seat



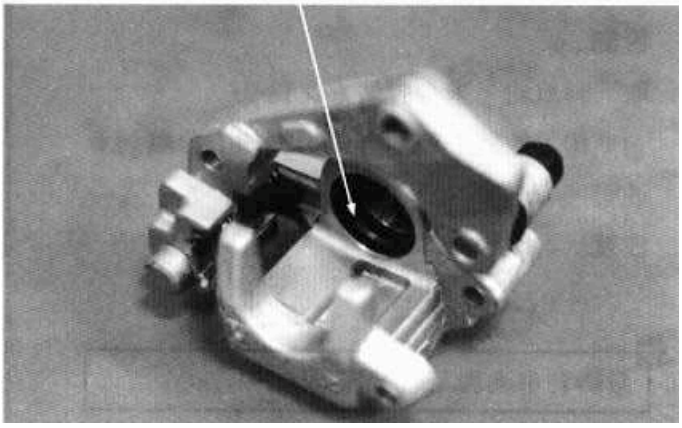
Remove the piston from the brake caliper. If necessary, use compressed air to squeeze out the piston through the brake fluid inlet opening and place a shop towel under the caliper to avoid contamination caused by the removed piston.
Check the piston cylinder for scratch or wear and replace if necessary.



Compressed Air

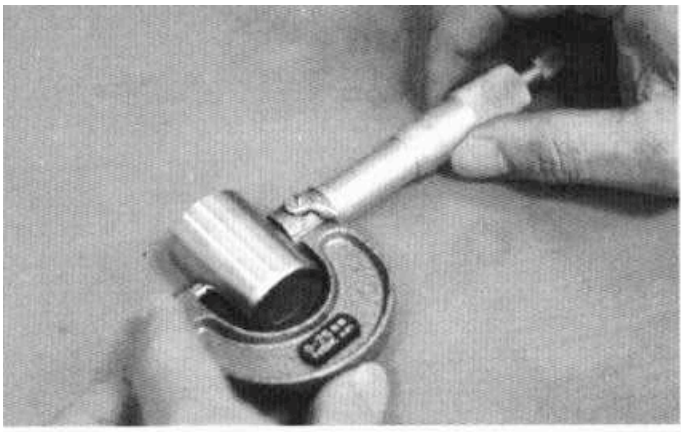
Piston Oil Seal

Push the piston oil seal outward to remove it.
Clean the oil seal groove with brake fluid.

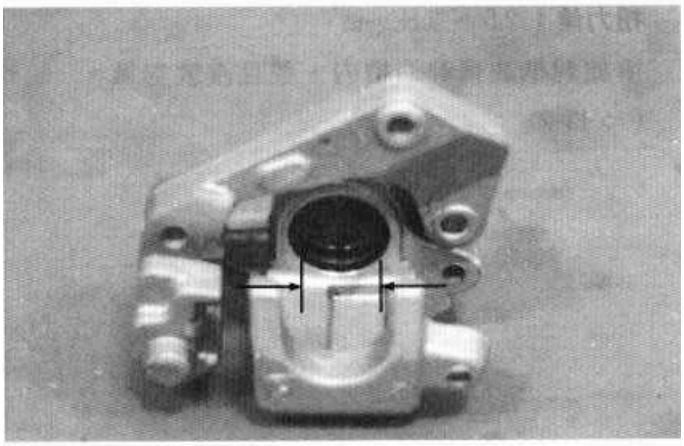


✱ Be careful not to damage the piston surface.

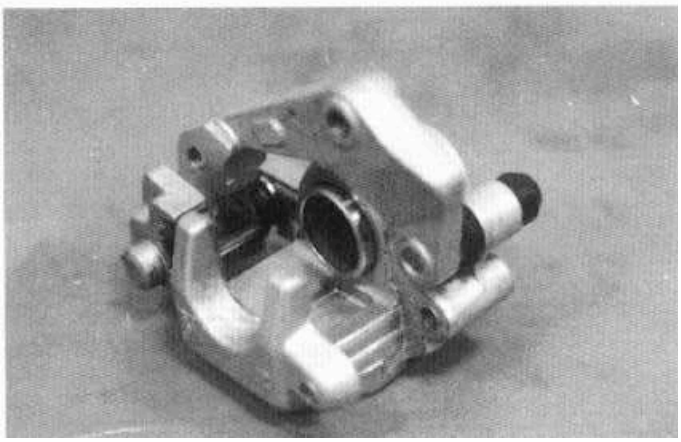
Check the piston for scratch or wear.
Measure the piston O.D. with a micrometer.
Service Limit: 25.45mm



Check the caliper cylinder for scratch or wear and measure the cylinder bore.
Service Limit: 25.30mm



Assembly
Clean all removed parts.
Apply silicon grease to the piston and oil seal. Lubricate the brake caliper cylinder inside wall with brake fluid.
Install the brake caliper piston with grooved side facing out.



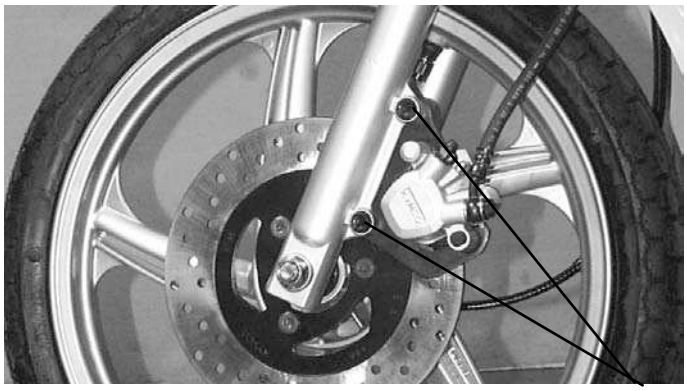
✱
Install the piston with its outer end 3_ 5mm protruding beyond the brake caliper.

Wipe off excessive brake fluid with a clean shop towel. Apply silicon grease to the brake caliper seat pin and caliper inside.
Install the brake caliper seat.

Installation

Install the brake caliper and tighten the two bolts.

Torque: 2.9_ 3.5kg-m

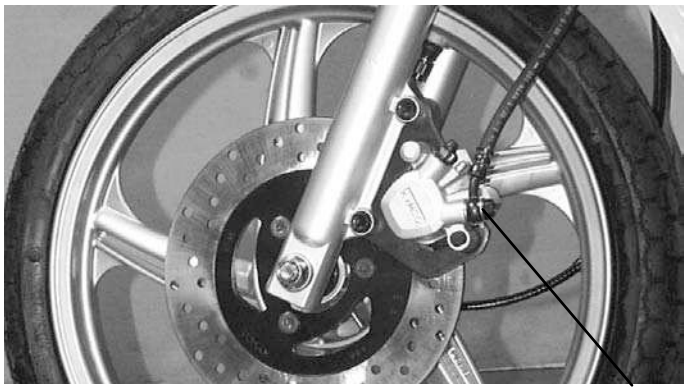


Bolts

Connect the brake fluid pipe to the brake caliper and tighten the fluid pipe bolt.

Torque: 3.0_ 4.0kg-m

Fill the brake reservoir with recommended brake fluid and bleed air from the brake system. (⇨13-12)

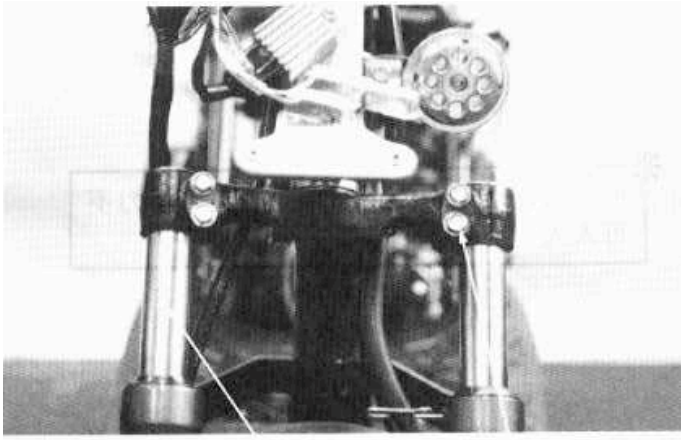


Bolt

FRONT SHOCK ABSORBER

REMOVAL

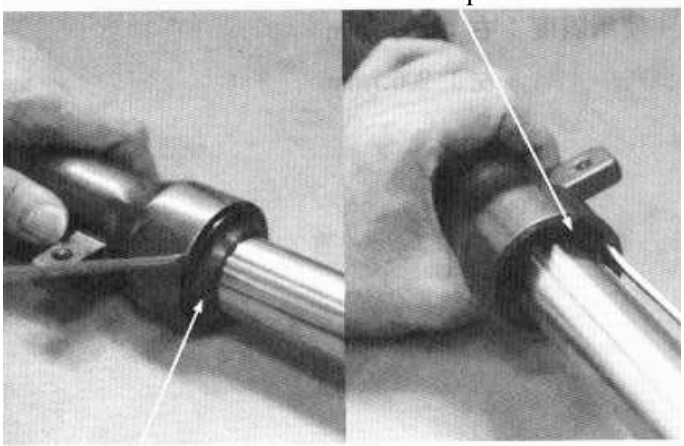
Remove the front wheel. (⇨13-5)
Remove the front fender. (⇨12-6)
Remove the front shock absorber upper mount bolts.
Loosen the lower mount bolts to remove the front shock absorbers.



Front Shock Absorber Mount Bolt

LEFT FRONT SHOCK ABSORBER DISASSEMBLY

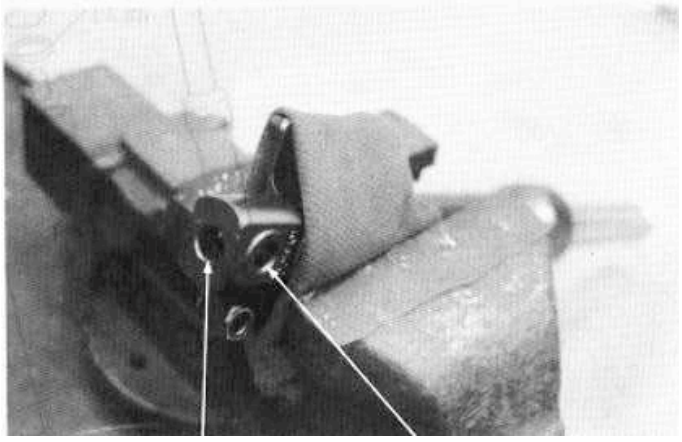
Remove the dust boot.
Remove the circlip.



Circlip

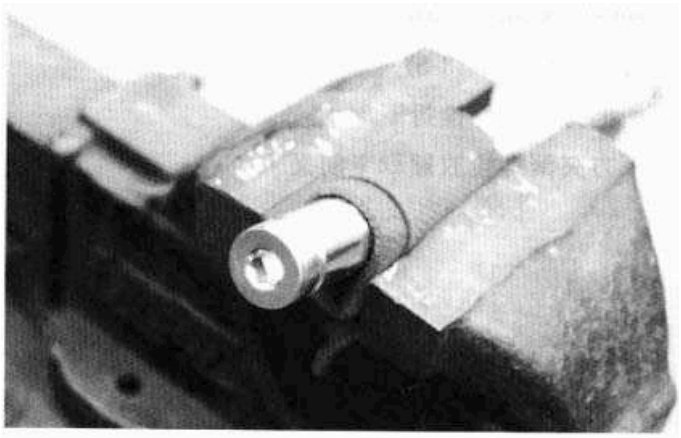
Dust Boot

Use a vise to hold the front shock absorber and remove the shock absorber tube, hex bolt and copper washer from the front shock absorber.



Bolt/Washer Front Shock Absorber

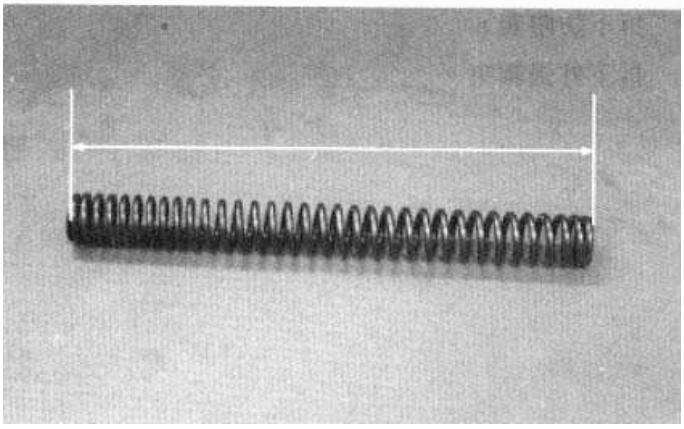
Use a vise to hold the front shock absorber tube and remove the damper from the shock absorber tube.



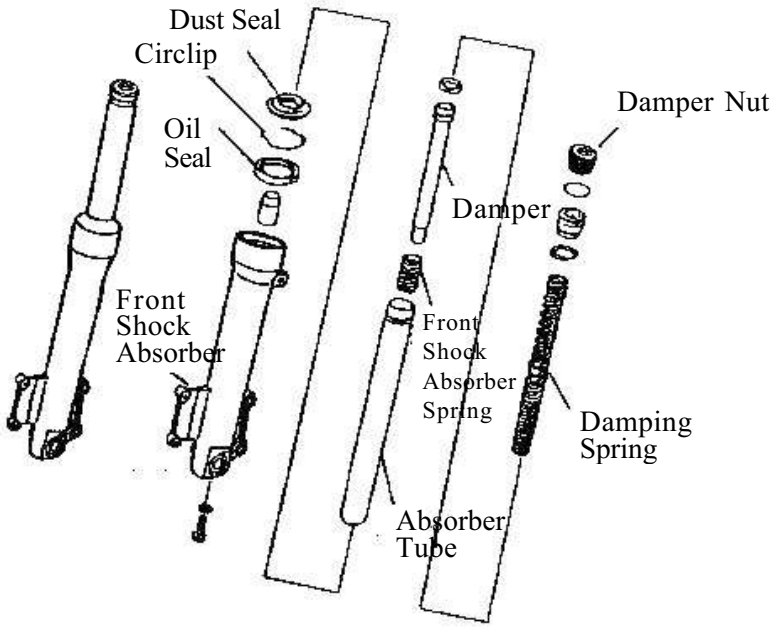
✱ When holding the shock absorber tube, place a shop towel under it and do not apply too much force.

Measure the front shock absorber spring free length.

Service Limit: Right : 200mm
Left : 200mm

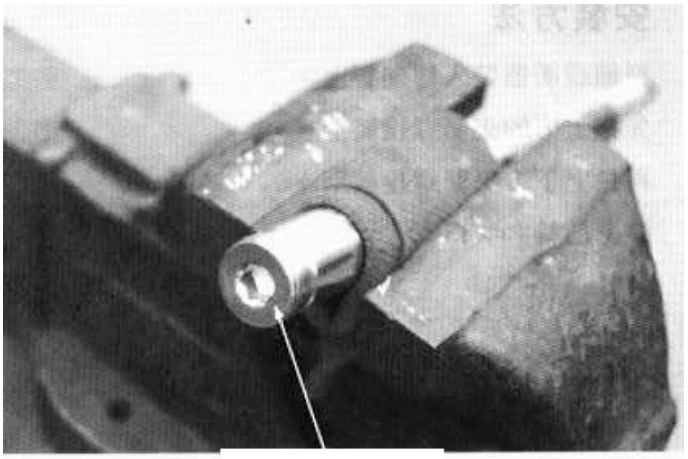


FRONT SHOCK ABSORBER ASSEMBLY



Install the damping spring to the damper and then install them into the front shock absorber tube.
Install the front shock absorber spring and tighten the damper nut.

✱ Install the front shock absorber spring with the loosely wound coils facing up.



Damper Nut

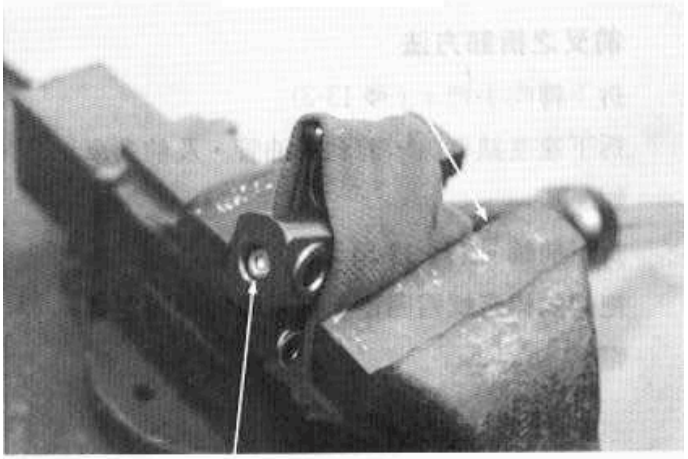
Front Shock Absorber

Use a vise to hold the front shock absorber.
Tighten the hex bolt.
(Apply locking agent to the washer and socket hex bolt and install them together.)

Torque: 1.5_ 3.0kg-m

Specified Oil: ss#8

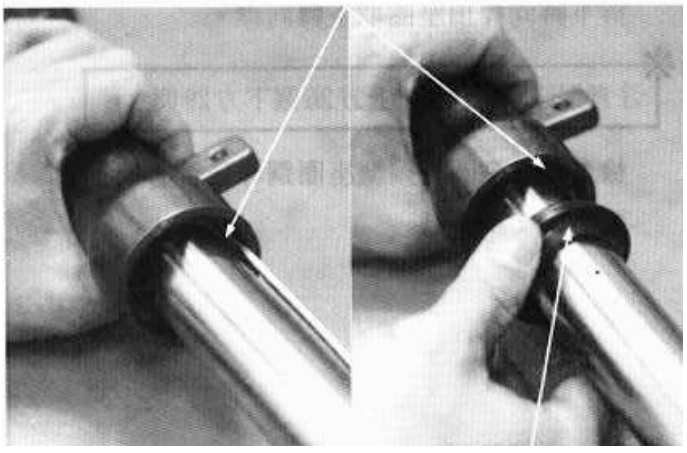
Oil Capacity: 61cc



Bolt/Washer

Circlips

Install the circlip.
Install the dust boot.

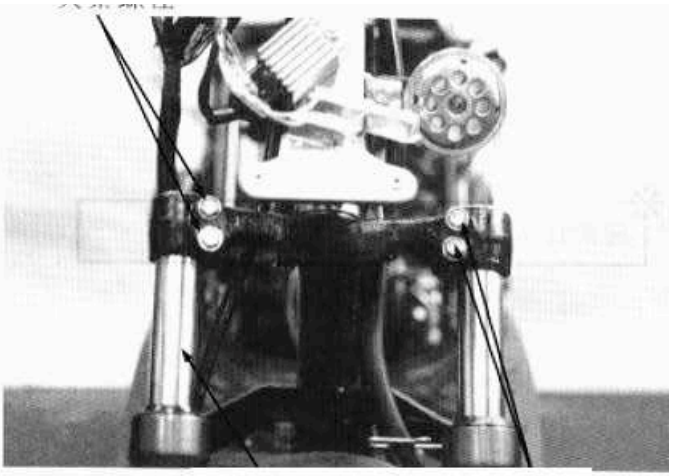


Dust Boot

INSTALLATION

Install the front shock absorbers onto the steering stem.
Install and tighten the front shock absorber upper mount bolts.
Tighten the lower mount bolts.
Install the front fender.
Install the front wheel. (⇨13-8)

Mount Bolts



Front Shock Absorber

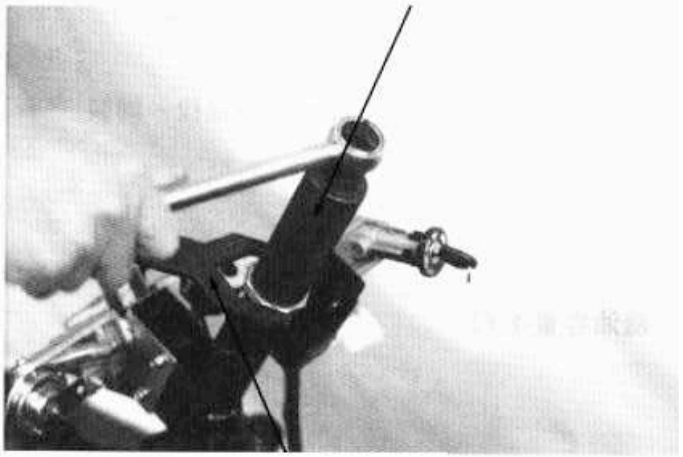
Mount Bolts

FRONT FORK

REMOVAL

Remove the steering handlebar. (⇨13-3)
Disconnect the speedometer cable and front brake fluid pipe and remove the front brake caliper.
Remove the front wheel. (⇨13-5)
Hold the steering stem top cone race and remove the steering stem lock nut.

Lock Nut Socket Wrench

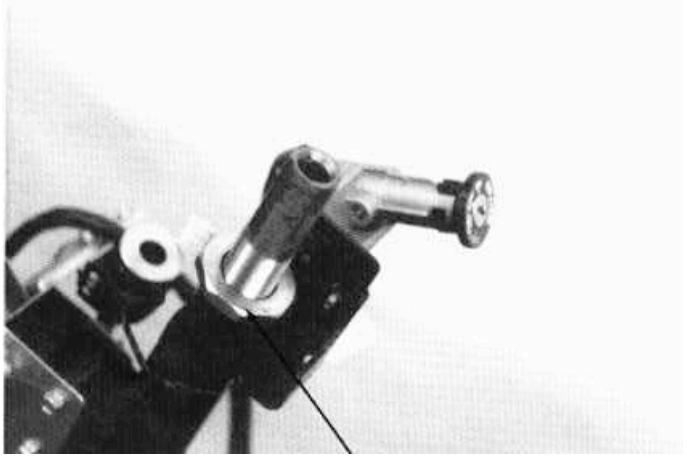


Lock Nut Wrench

Remove the top cone race and remove the front fork.

* Be careful not to lose the steel balls (26 on top race and 19 on bottom race).

Inspect the ball races, cone races and steel balls for wear or damage. Replace if necessary.

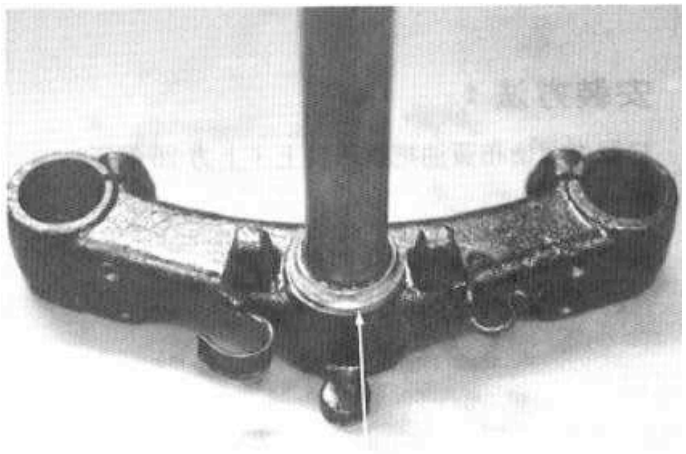


Top Cone Race

BOTTOM CONE RACE REPLACEMENT

Remove the bottom cone race using a chisel. Drive a new bottom cone race into place with a proper driver.

✱ Be careful not to damage the steering stem and front fork.

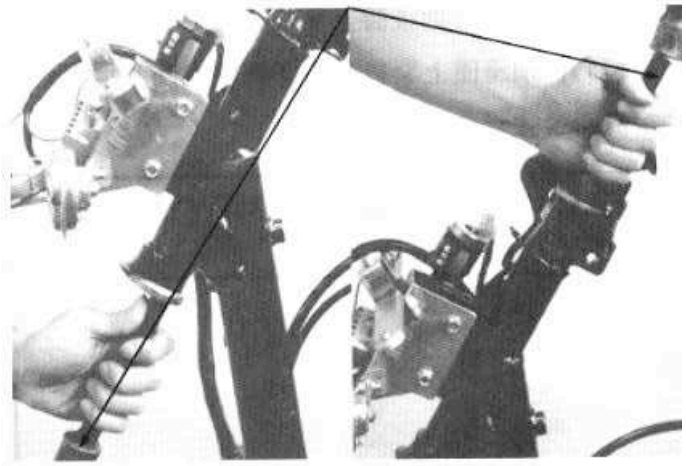


Bottom Cone Race

BALL RACE REPLACEMENT

Drive out the ball races.

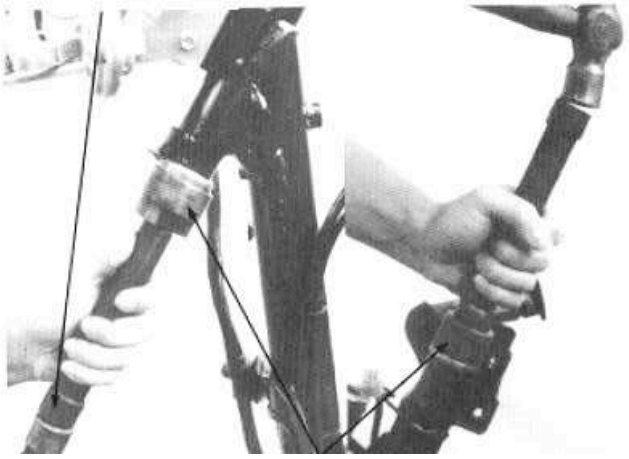
Ball Race Remover



Drive in new ball races.

✱ Be sure to drive the ball races into place completely.

Driver Handle A



Outer Driver, 37x40mm

INSTALLATION

Apply grease to top and bottom ball races and install 26 steel balls on the top ball race and 29 steel balls on the bottom ball race.
Apply grease to the ball races again and then install the front fork.

Apply grease to the top cone race and install it.
Tighten the top cone race and then turn the steering stem right and left several times to make steel balls contact each other closely.

✱ Check that the steering stem rotates freely without vertical play.

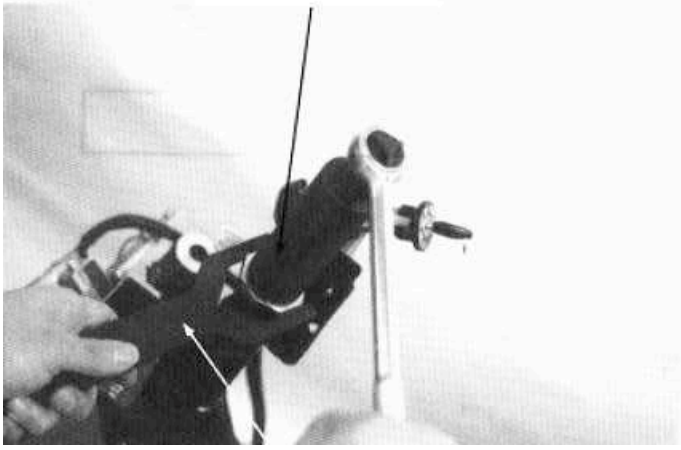
Top Cone Race

Lock Nut Socket Wrench

Install the steering stem lock nut and tighten it while holding the top cone race.

Torque: 8.0_ 12.0kg-m

Install the handlebar. (⇨13-4)
Install the speedometer cable.



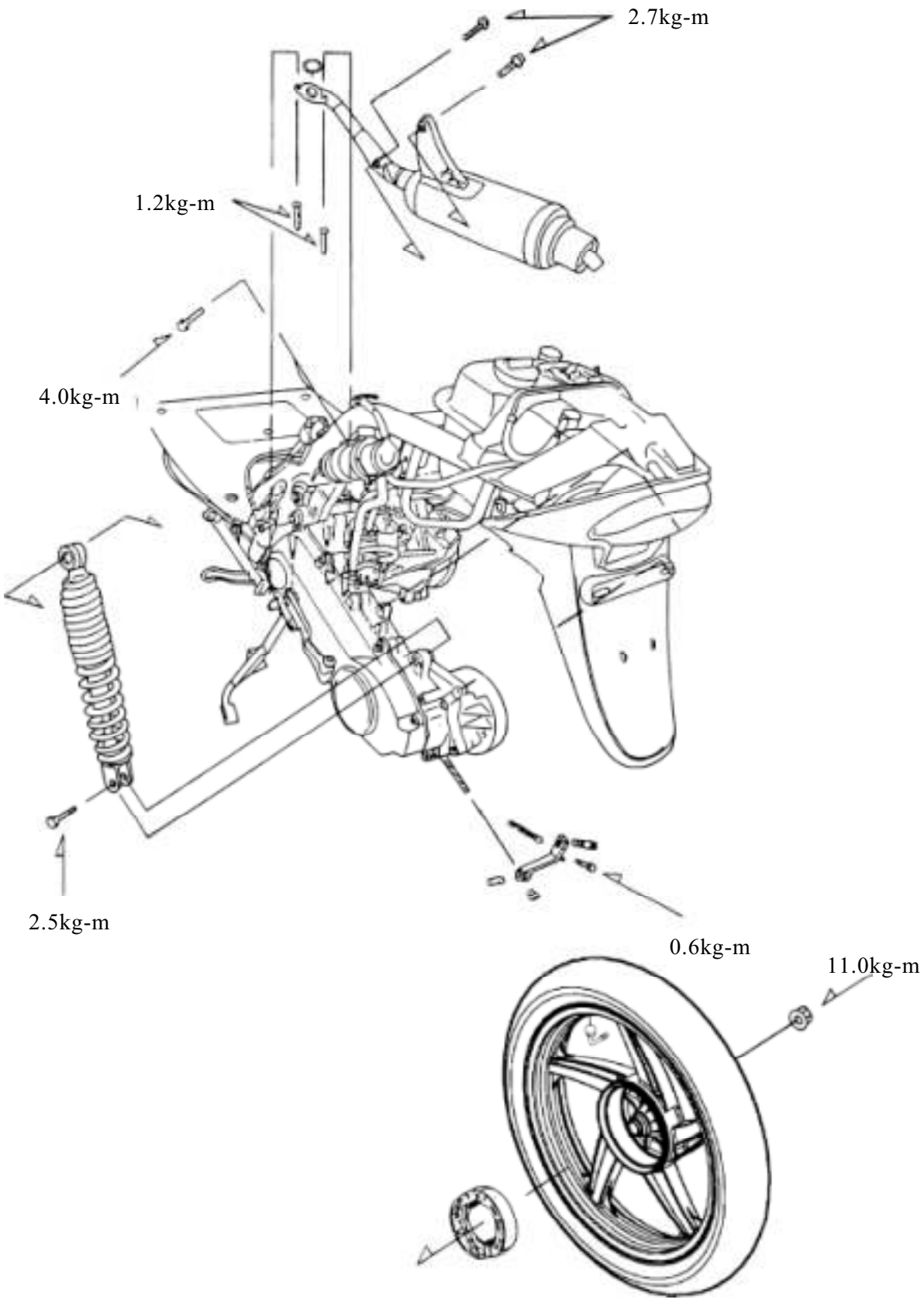
Lock Nut Wrench

14

REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

SERVICE INFORMATION..... 14-2
TROUBLESHOOTING..... 14-2
REAR WHEEL 14-3
REAR BRAKE..... 14-4
REAR SHOCK ABSORBER..... 14-7

14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER



SERVICE INFORMATION

SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
Rear wheel rim runout		2.0
Rear brake drum I.D.	110	111
Rear brake lining thickness	4.0	2.0
Rear shock absorber spring free length	235.7	218.7

TORQUE VALUES

Rear axle nut	11.0	13.0kg-m
Rear shock absorber upper mount bolt	3.5	4.5kg-m
Rear shock absorber lower mount bolt	2.4	3.0kg-m
Rear shock absorber lower joint nut	3.5	4.5kg-m (apply locking agent)

SPECIAL TOOL

Rear shock absorber remover
Rear shock absorber compressor

TROUBLESHOOTING

Rear wheel wobbling
- Bent rim
- Faulty tire
- Axle not tightened properly

Soft rear shock absorber
- Weak shock absorber spring

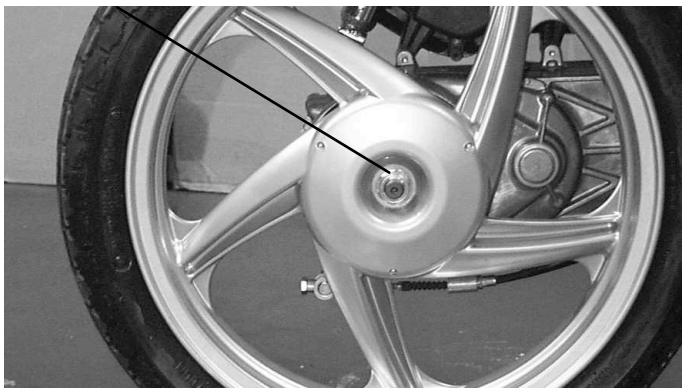
Poor brake performance
- Brake not adjusted properly
- Contaminated brake linings
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Improper engagement between brake arm and wear indicator plate

REAR WHEEL

REMOVAL

Remove the two exhaust muffler joint lock nuts.
Remove the two exhaust muffler lock bolts.
Remove the exhaust muffler.
Remove the rear axle nut to remove the rear wheel.

Rear Axle Nut

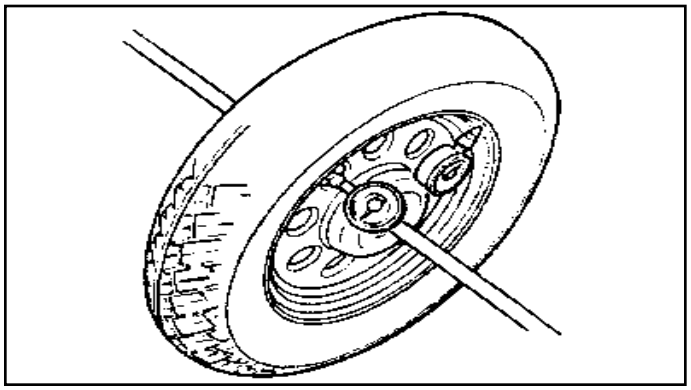


INSPECTION

Measure the rear wheel rim runout.

Service Limits:

Radial : 2.0mm replace if over
Axial : 2.0mm replace if over



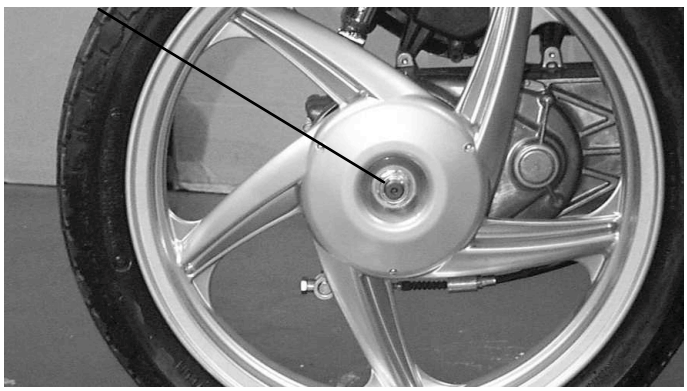
INSTALLATION

Install the rear wheel and apply SAE30# engine oil to the axle threads. Then, tighten the rear axle nut.

Torque values:

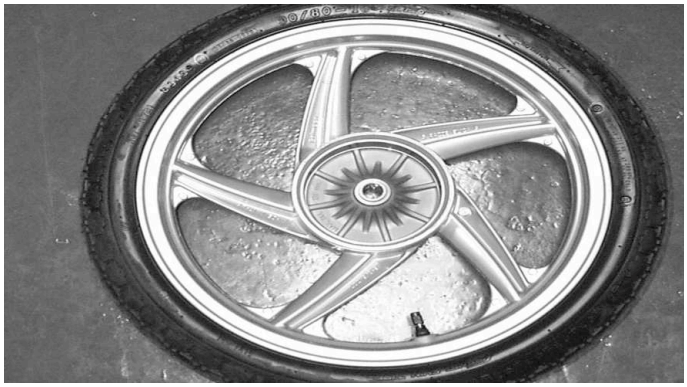
Rear axle nut: 11.0_ 13.0kg-m

Rear Axle Nut



REAR BRAKE

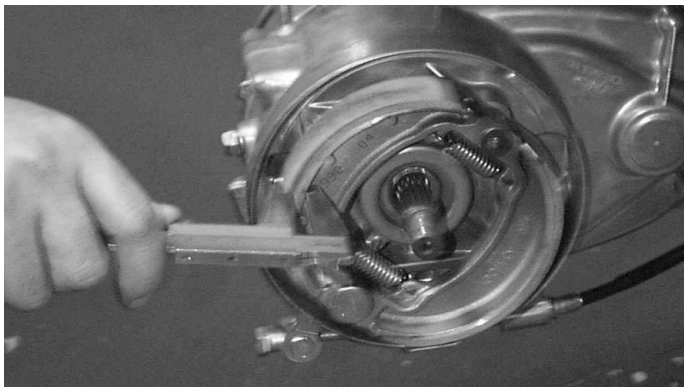
Remove the rear wheel. (⇨14-3)
Inspect the rear brake drum.
Measure the rear brake drum I.D.
Service Limit: 95.5mm replace if over



BRAKE LINING INSPECTION

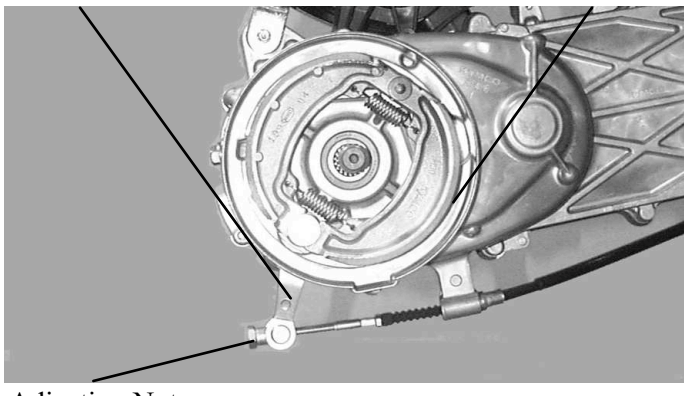
Measure the brake lining thickness.
Service Limit: 2.0mm replace if below

✱ Keep oil or grease off the brake linings.

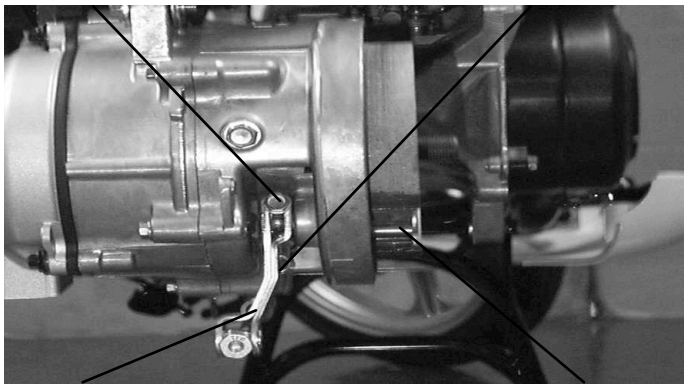


REAR BRAKE DISASSEMBLY

Remove the rear brake adjusting nut and disconnect the rear brake cable.
Remove the rear brake shoes.

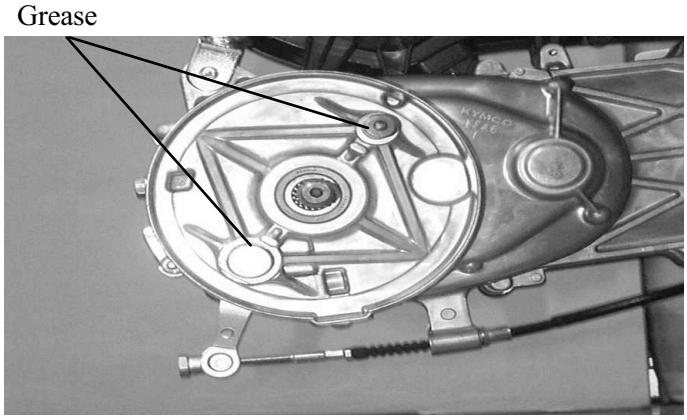


Remove the brake cam bolt to remove the brake arm, wear indicator plate and felt seal.
Remove the. brake arm.



REAR BRAKE ASSEMBLY

Apply grease to the anchor pin and brake shoe moving parts.
Apply grease to the brake cam and install it.

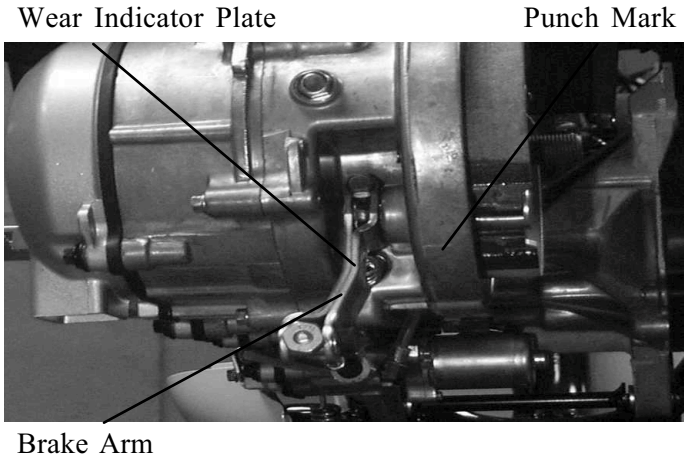


Apply engine oil to the felt seal and install it to the brake cam.
Install the wear indicator plate.

* Align the wide tooth of the wear indicator plate with the wide groove on the brake cam.

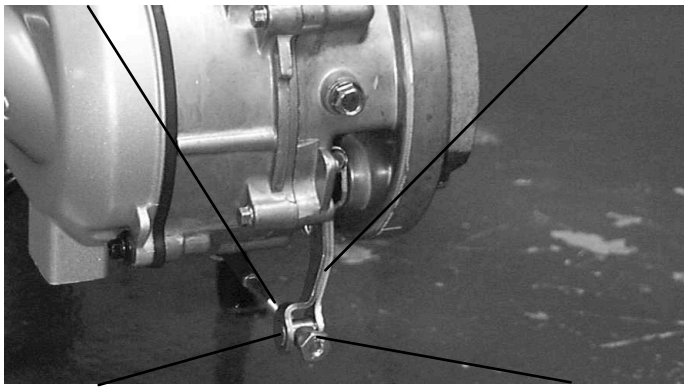
Install the brake arm onto the brake cam.

* Align the punch mark on the brake arm with the scribed line on the brake cam.



Install and tighten the brake arm bolt.
Install the brake arm return spring.
Install the brake shoes.

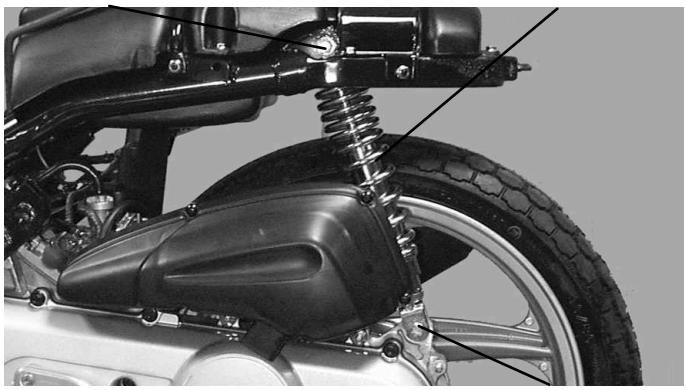
Install the brake arm pin.
Connect the brake cable and install the adjusting nut.
Install the rear wheel. (⇨14-3)
Adjust the rear brake lever free play. (⇨3-4)



REAR SHOCK ABSORBER

REMOVAL

Remove the front cover. (⇨12-6)
Remove the met-in box. (⇨12-5)
Remove the air cleaner case. (⇨5-2)
Remove the rear shock absorber upper and lower mount bolts to remove the rear shock absorber.

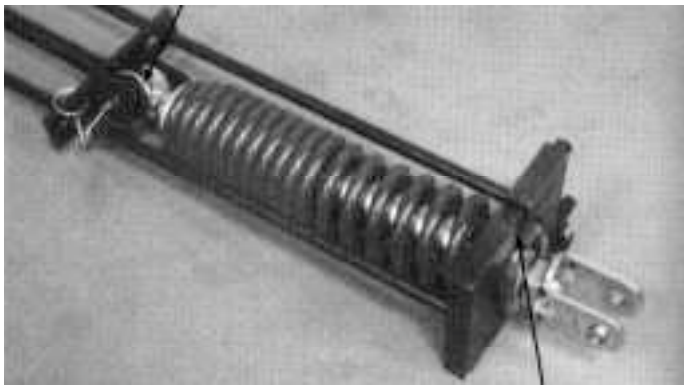


DISASSEMBLY

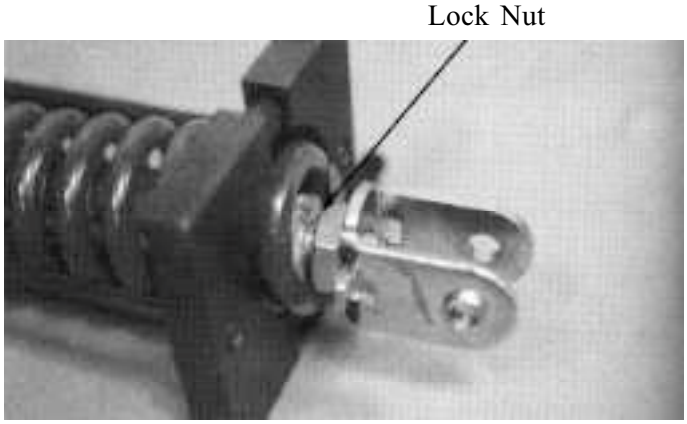
Install the rear shock absorber compressor as the figure shown.

✱ Install the rear shock absorber lower joint into the rear shock absorber compressor.

Compress the rear shock absorber spring.



Loosen the lower joint lock nut.
Remove the lower joint.
Remove the lock nut, rubber and damper.

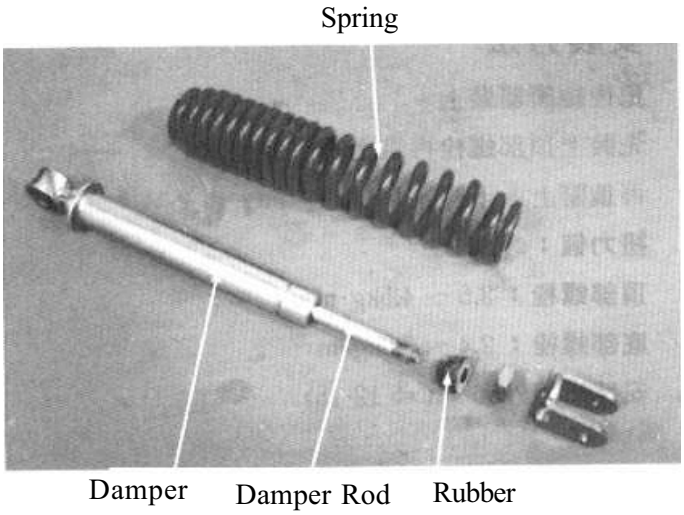


INSPECTION

Inspect the damper rod for bending or damage.

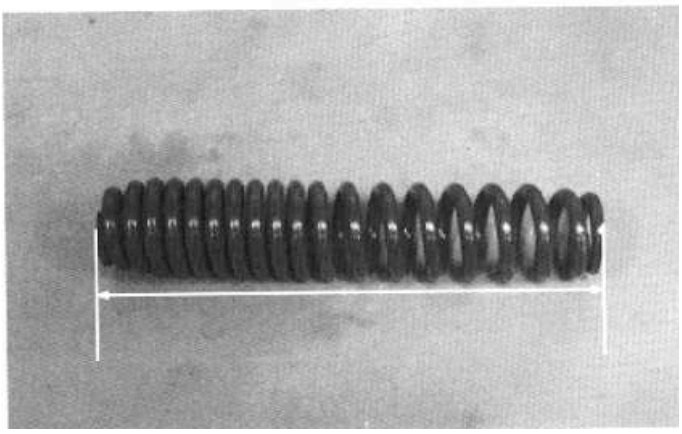
Inspect the damper for oil leaks.

Inspect the damper rubber for deterioration or damage.



Measure the rear shock absorber spring free length.

Service Limit: 232mm replace if below



ASSEMBLY

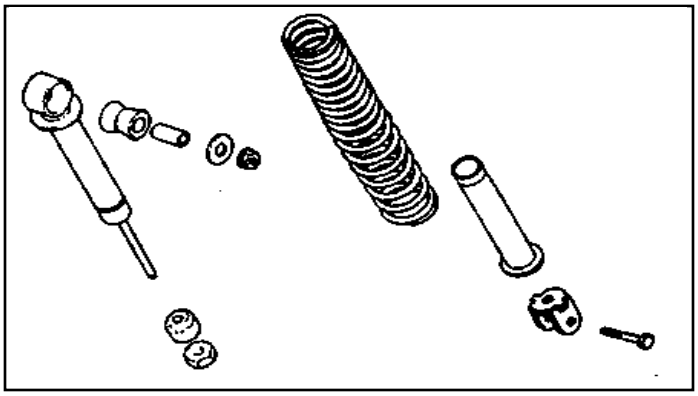
Assemble the rear shock absorber in the reverse order of disassembly.

✱ Install the shock absorber spring with loosely wound coils facing down.

Apply locking agent to the lock nut thread and then install and tighten the lock nut.

Tighten the lock nut.

Torque: 3.5_ 4.5kg-m



INSTALLATION

Install the rear shock absorber.
Install the rear shock absorber upper mount bolt and then install the lower mount bolt.

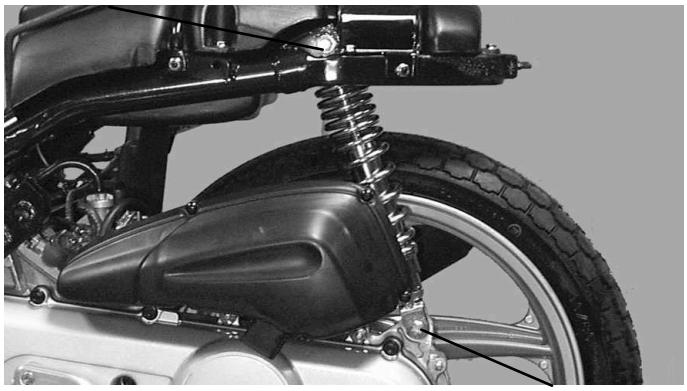
Torque:

Upper Mount Bolt: 3.5_ 4.5kg-m

Lower Mount Bolt: 2.4_ 3.0kg-m

Install the frame body cover. (⇨12-5)

Upper Mount Bolt



Lower Mount Bolt

15

ELECTRICAL EQUIPMENT

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TROUBLESHOOTING 15- 1
CHARGING SYSTEM 15- 3
BATTERY 15- 4
IGNITION SYSTEM 15- 7
STARTING SYSTEM 15-11

15. ELECTRICAL EQUIPMENT

SERVICE INFORMATION

GENERAL INSTRUCTIONS

It is not necessary to check the battery electrolyte or fill with distilled water.
Remove the battery from the motorcycle for charging. Do not remove the electrolyte cap..
Do not quick charge the battery. Quick charging should only be done in an emergency..
Charge the battery according to the charging current and time specified on the battery.
When charging, check the voltage (open voltage) with an electric tester.
When replacing the battery, do not use a traditional battery.

SPECIFICATIONS			BA10AB.AC.
Battery	Capacity		12V4AH
	Voltage		13.0_ 13.2V
	Charging current	Standard	0.4A/5H
		Quick	4A/0.5H
Spark plug	(NGK)		BR8HSA
Spark plug gap			0.6_ 0.7mm
Ignition coil resistance	Primary coil		0.2_ 0.3Ω
	Secondary coil (with plug cap)		7.0_ 8.4KΩ
	Secondary coil (without plug cap)		2.5_ 3.2KΩ
Pulser coil resistance (20℃)			80_ 160Ω
Ignition timing			8 ~14 ±1.5 BTDC/2000rpm

TROUBLESHOOTING

CHARGING SYSTEM

No power
- Dead battery
- Disconnected battery cable
- Fuse burned out
- Faulty ignition switch

Low power
- Weak battery
- Loose battery connection
- Charging system failure
- Faulty regulator/rectifier

Intermittent power
- Loose battery cable connection
- Loose charging system connection
- Loose connection or short circuit in ignition system
- Loose connection or short circuit in lighting system

Charging system failure
- Loose, broken or shorted wire or connector
- Faulty regulator/rectifier
- Faulty A.C. generator

IGNITION SYSTEM

No spark at plug

Faulty spark plug
Poorly connected, broken or shorted wire
- Between A.C. generator and CDI unit
- Between CDI unit and ignition coil
- Between CDI unit and ignition switch
- Between ignition coil and spark plug

Faulty ignition switch
Faulty ignition coil
Faulty CDI unit
Faulty A.C. generator

Engine starts but turns poorly

Ignition primary circuit
- Faulty ignition coil
- Poorly connected wire or connector

Ignition secondary circuit
- Faulty ignition coil
- Faulty spark plug
- Poorly insulated plug cap

Improper ignition timing
- Battery voltage too low (6V max.)
- Faulty CDI unit

STARTING SYSTEM

Starter motor won‘t turn

Fuse burned out
Weak battery
Faulty ignition switch
Faulty starter switch
Faulty front or rear stop switch
Faulty starter relay
Poorly connected, broken or shorted wire
Faulty starter motor

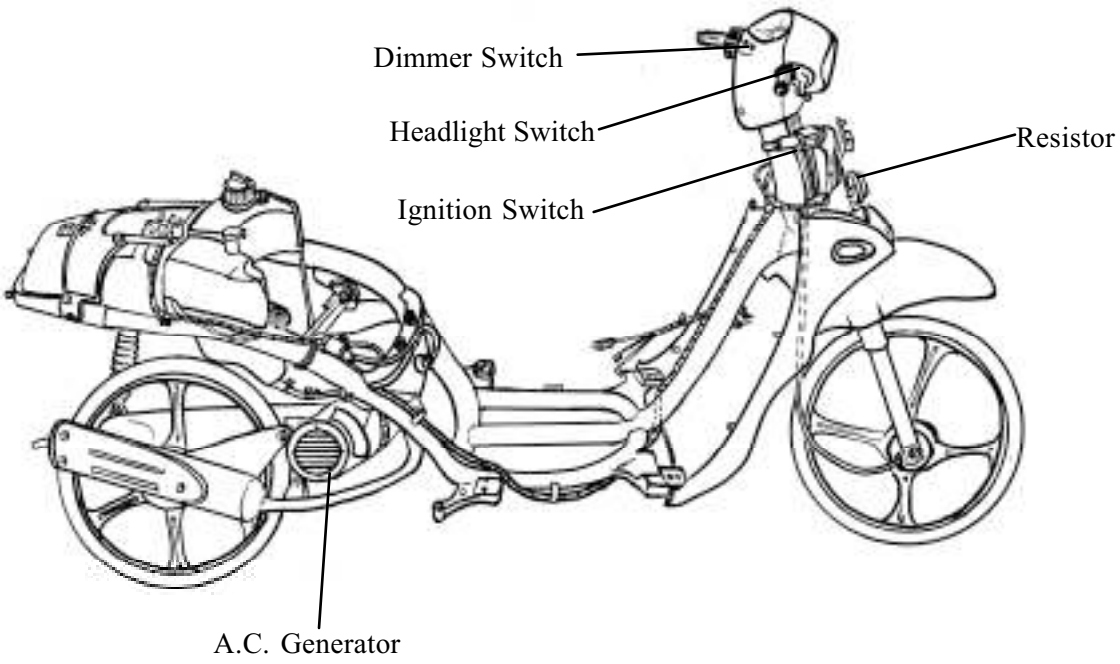
Lack of power

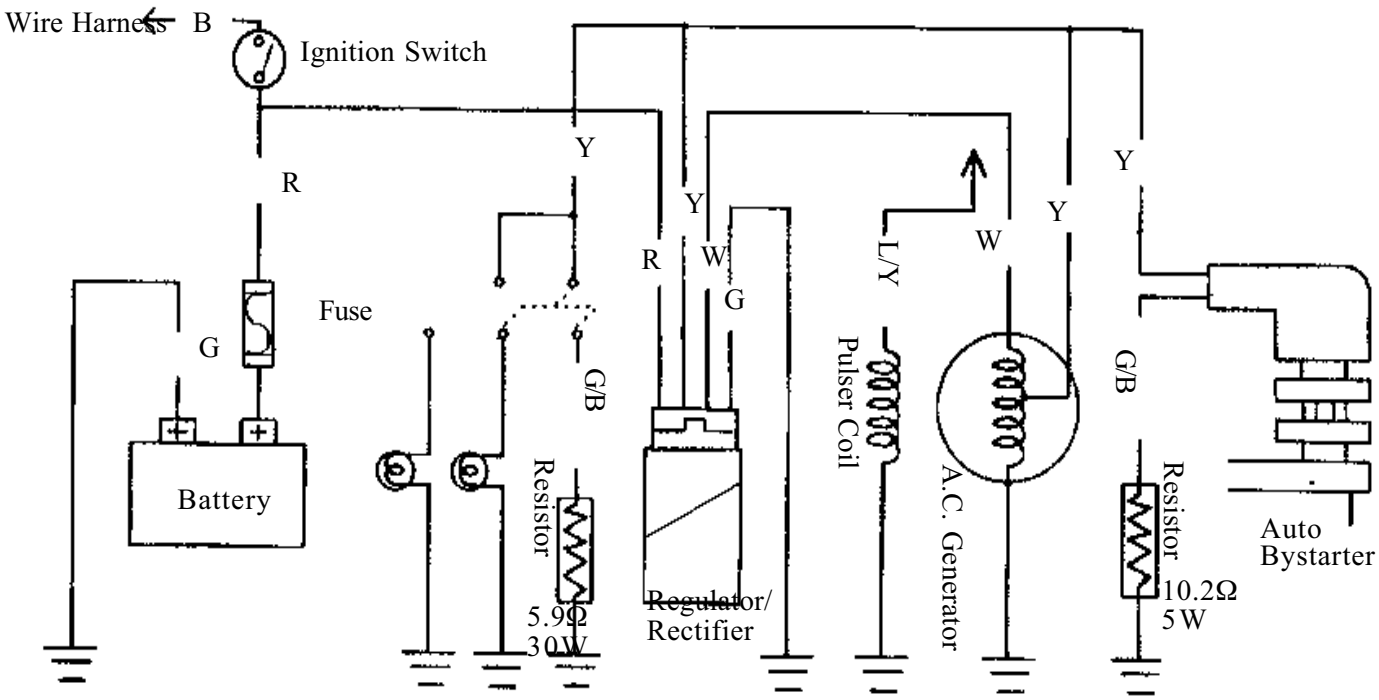
Weak battery
Loose wire or connection
Foreign matter stuck in starter motor or pinion

Starter motor rotates but engine does not start

Faulty starter pinion
Starter motor rotates reversely
Faulty starter clutch
Weak battery

CHARGING SYSTEM





BATTERY

BATTERY REMOVAL

Remove the front tool box cover.
Disconnect the battery cables .

✱ First disconnect the battery negative (-) cable and then the positive (+) cable.

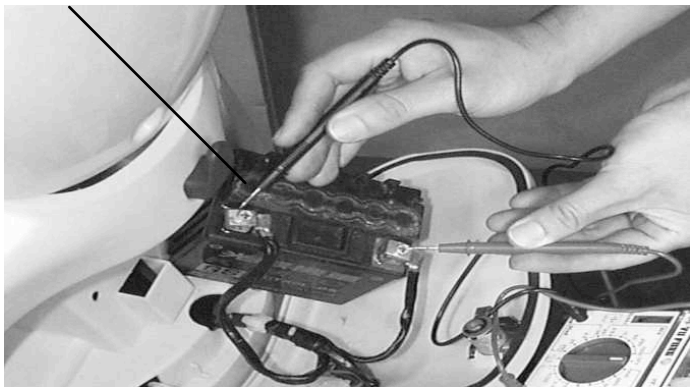
Remove the bolt and battery bracket.
Remove the battery.
The installation sequence is the reverse of removal.

Front tool box Cover

BATTERY CHARGING (OPEN CIRCUIT VOLTAGE) INSPECTION

Remove the battery cover and disconnect the battery cables.
Measure the voltage between the battery terminals.
Fully charged : 13.0V_ 13.2V
Undercharged : 12.3V max.

Battery



✱ Battery charging inspection must be performed with an electric tester.

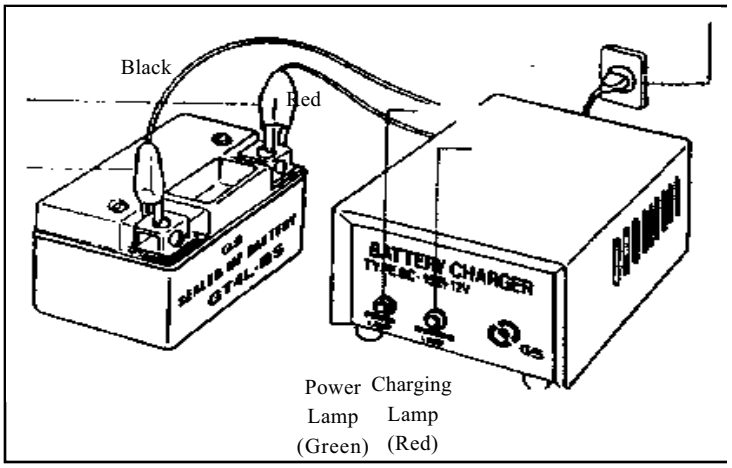
CHARGING METHOD

Connect the charger positive (+) cable to the battery positive (+) cable.
Connect the charger negative (-) cable to the battery negative (-) cable.

✱ Keep flames and sparks away from a charging battery.

Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery.

Charge the battery according to the current specified on the battery surface.



Charging current : Standard : 0.4A
Quick : 4A
Charging time : Standard : 5 hours
Quick : 0.5 HOUR
After charging: Open circuit voltage: 12.8V min.

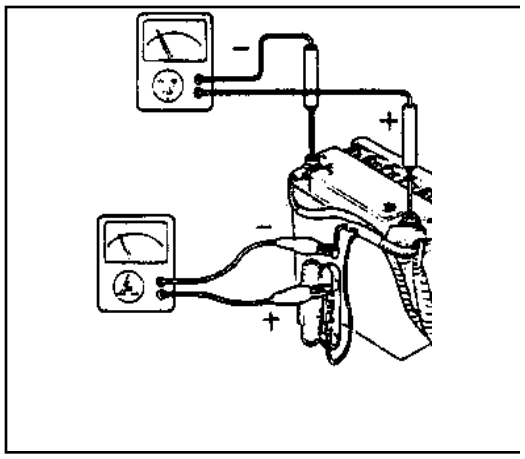
✱ Quick charging should only be done in an emergency.
During quick charging, the battery temperature should not exceed 45℃ .
Measure the voltage 30 minutes after the battery is charged.

PERFORMANCE TEST

Warm up the engine.
Remove the floor mat and front tool box cover.

✱ Use a fully charged battery to check the charging system output.

Stop the engine and open the fuse box. Disconnect the wire lead from the fuse terminal. Connect an ammeter between the wire lead and fuse terminal as shown. Connect the battery positive (+) terminal to the voltmeter positive (+) probe and battery negative (-) terminal to the voltmeter negative (-) probe.
Start the engine, gradually increase engine speed to test the output:



Position / RPM	Day	Night
2500	1.3A min.	1.0A min.
6000	2.0A min.	2.0A min.

Charging Limit Voltage: 14.5±0.5V/8000rpm
If the limit voltage is not within the specified range, check the regulator/ rectifier.

A.C. GENERATOR (CHARGING COIL) INSPECTION

✱ Inspect with the engine installed.

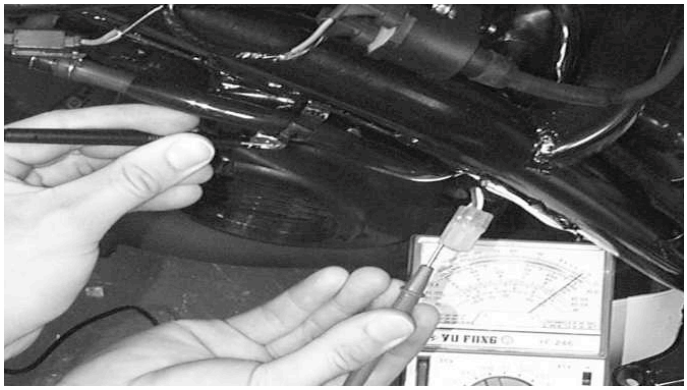
Remove the met-in box. (⇨12-4)
Disconnect the A.C. generator connector.
Measure the resistances between the charging coil terminals (whiteñgreen) and lighting coil terminals (yellowñgreen).

Resistances:

Charging coil	whiteñgreen	0.2_ 1.2 Ω
Lighting coil	yellowñgreen	0.3_ 1.0 Ω

Refer to 7-3 for A.C. generator removal.

A.C. Generator Connector

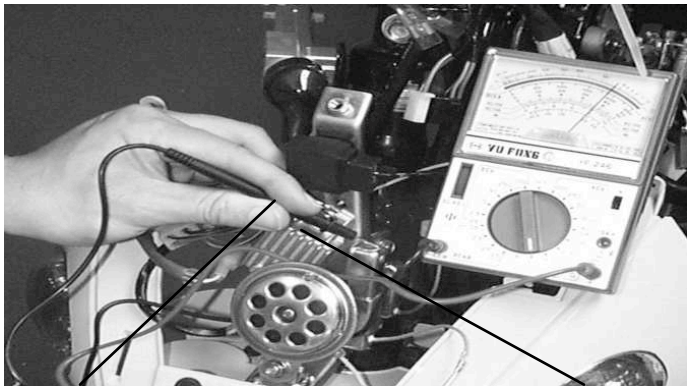


RESISTOR INSPECTION

Remove the frame front cover. (⇨12-3)
Measure the resistance between the resistor B pink wire and ground.
Measure the resistance between the resistor A green/black wire and ground.

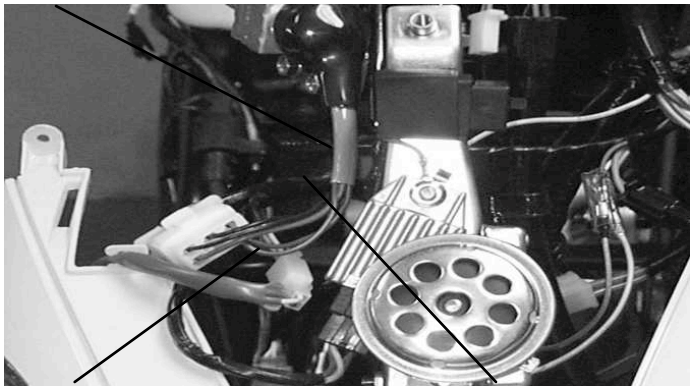
Resistances:
Resistor A: 9.9_ 12.0Ω
Resistor B: 5.6_ 7.2Ω

✱ Faulty resistor is the cause of faulty operation of the auto bystarter.



REGULATOR/RECTIFIER INSPECTION

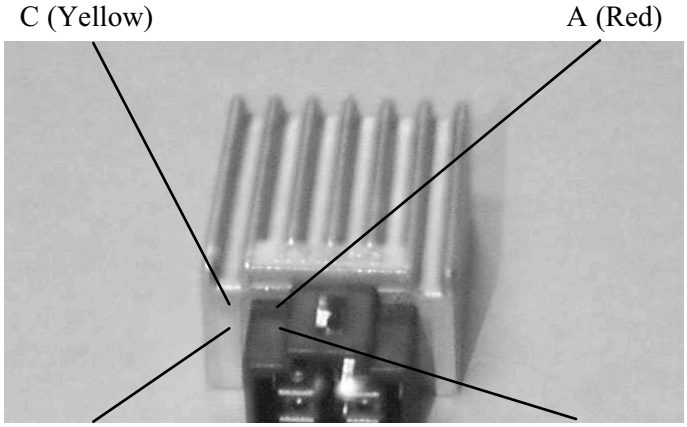
Remove the front cover. (⇨12-3)
Disconnect the regulator/rectifier wire coupler and remove the bolt to remove the regulator/rectifier.



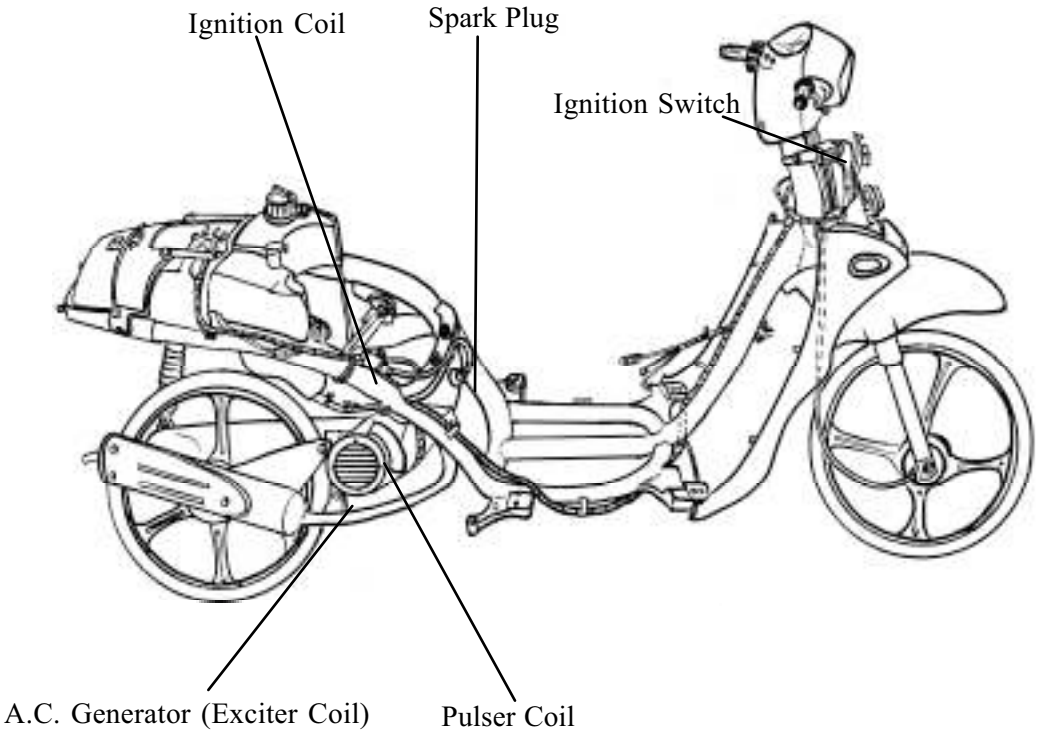
Measure the resistances between the terminals.
Replace the regulator/rectifier if the readings are not within the specifications in the table below.

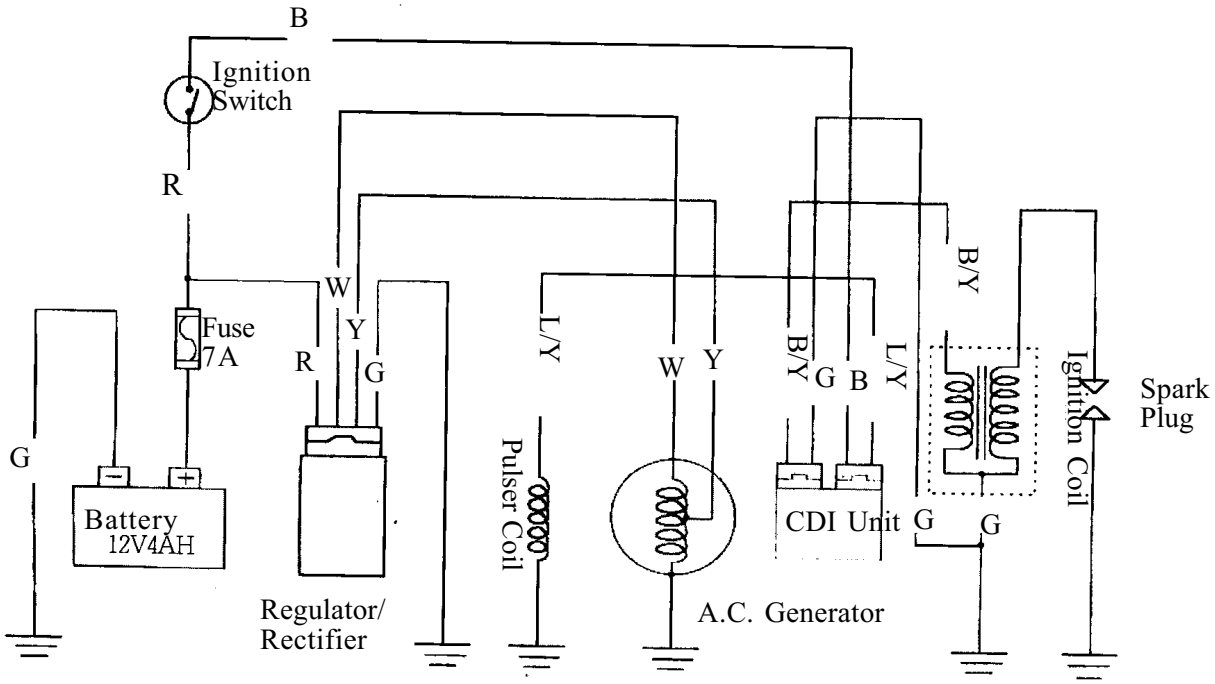
✱ Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
Use a Sanwa Electric Tester (07208-0020000) or Kowa Electric Tester (TH-5H). The proper range for testing is listed below.

Model	Brand	Range
SP-10D	Sanwa	KΩ
TH-5H	Kowa	100Ω



Probe⊕ / Probe(-)	A (R)	B (W)	C (Y)	D (G)
A (R)		20-35KΩ	∞	∞
B (W)	8-20KΩ		∞	∞
C (Y)	∞	∞		∞
D (G)	∞	∞	6.5-35KΩ	


Ignition Coil
Spark Plug
Ignition Switch
A.C. Generator (Exciter Coil)
Pulser Coil

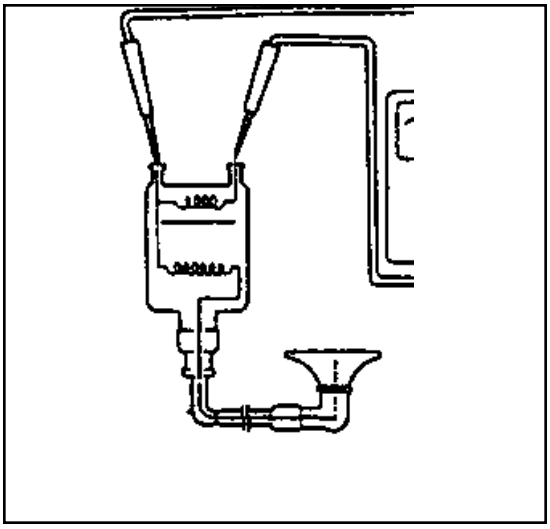

B
Ignition Switch
R
W
Y
G
Fuse 7A
R
G
L/Y
W
Y
B/Y
G
B
L/Y
B/Y
Ignition Coil
Spark Plug
G
Battery 12V4AH
Regulator/ Rectifier
Pulser Coil
A.C. Generator
CDI Unit
G
G

IGNITION COIL INSPECTION

Continuity Test

✱ This test is to inspect the continuity of ignition coil.

Remove the met-in box. (⇨12-4)
Measure the resistance between the ignition coil primary coil terminals.
Resistance (20℃): 0.153_ 0.187Ω



Measure the secondary coil resistance between the spark plug cap and the primary coil terminal as Figure A shown.
Resistance (20℃) (with plug cap): 7.0_ 8.4KΩ

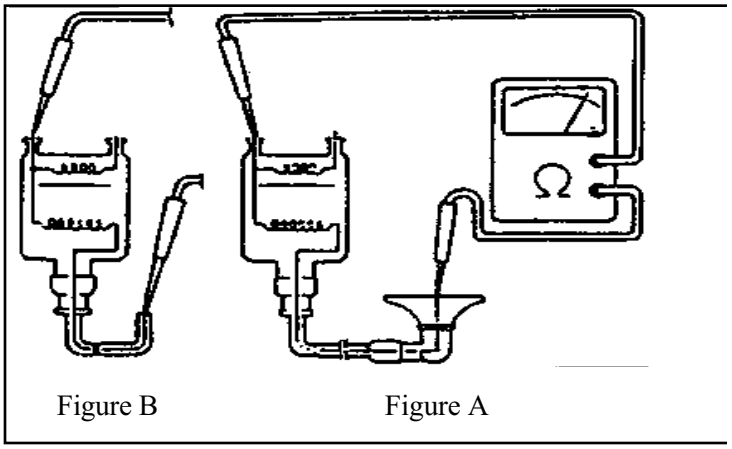
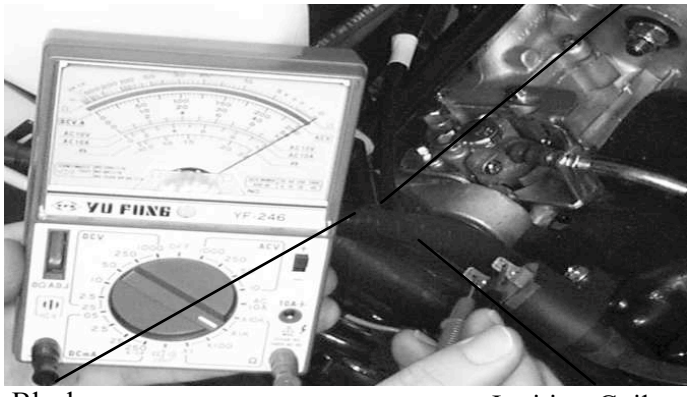


Figure B Figure A

Measure the secondary coil resistance between the ignition coil terminal and the primary coil terminal as Figure B shown.
Resistance (20℃) (without plug cap): 2.5_ 3.2KΩ



Performance Test

Remove the ignition coil.

Ignition Coil

Inspect the ignition coil with an ignition coil tester.

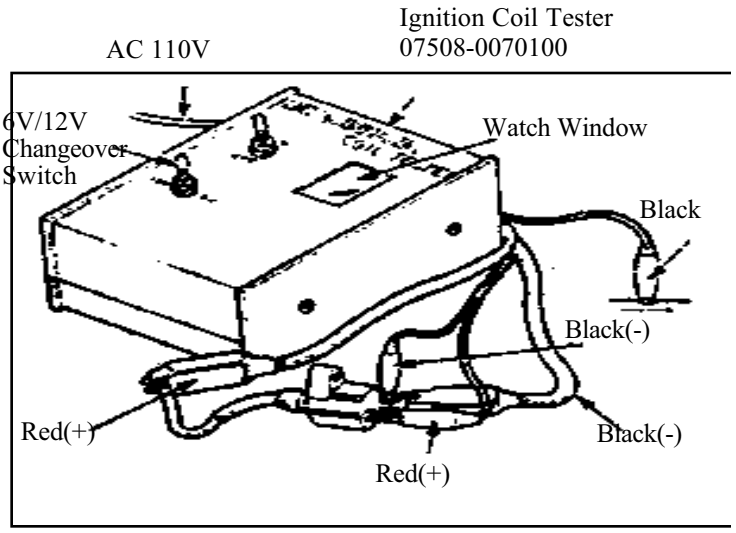
✱ Follow the ignition coil tester manufacturer's instructions.

1. Turn the changeover switch to 12V and connect the ignition coil to the tester.
2. Turn the power switch ON and check the spark from the watch window.

Good : Normal and continuous spark

Faulty : Weak or intermittent spark

✱ The test is performed at both conditions that the ignition coil is cold and hot.



A.C. GENERATOR

Exciter Coil/Pulser Coil Inspection

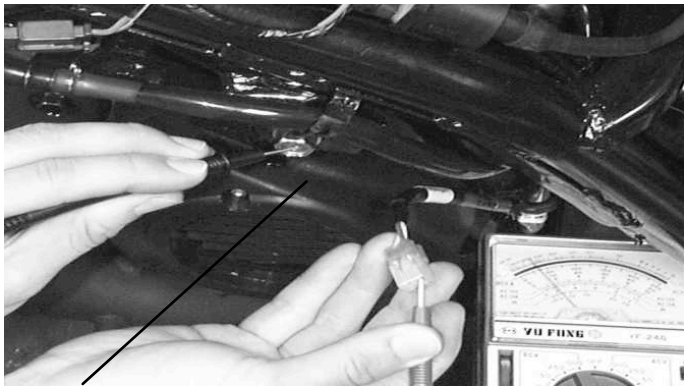
✱ This test is performed with the stator installed in the engine.

Remove the met-in box. (⇨12-4)

Disconnect the A.C. generator wire connector.

Measure the pulser coil resistance between the blue/yellow wire and ground.

Resistance (20℃): 100 150Ω



Blue/Yellow

CDI UNIT INSPECTION

Remove the battery cover.
Disconnect the CDI coupler and remove the CDI unit.

Coupler

CDI Unit

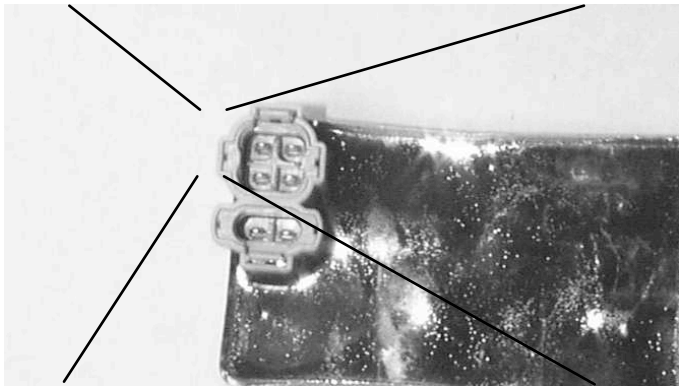
CDI CIRCUIT INSPECTION

Measure the resistance between the terminals.
Replace the CDI unit if the readings are not within the specifications in the table below.

✱ Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
Use a Sanwa Electric Tester or Kowa Electric Tester (TH-5H).
In this table, "Needle swings then returns" indicates that there is a charging current applied to a condenser. The needle will then remain at "∞ " unless the condenser is discharged.

Black/ Yellow

Green



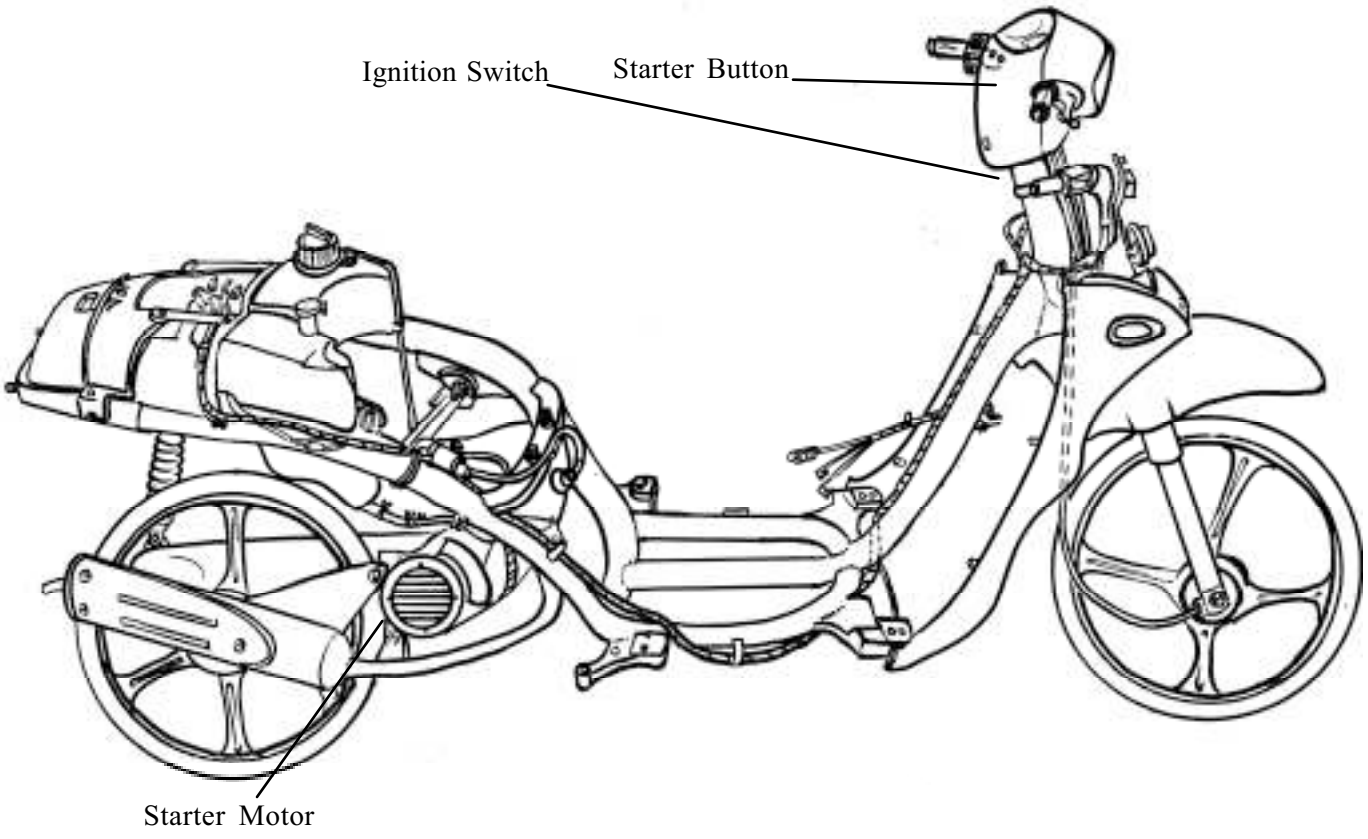
Blue/ Yellow

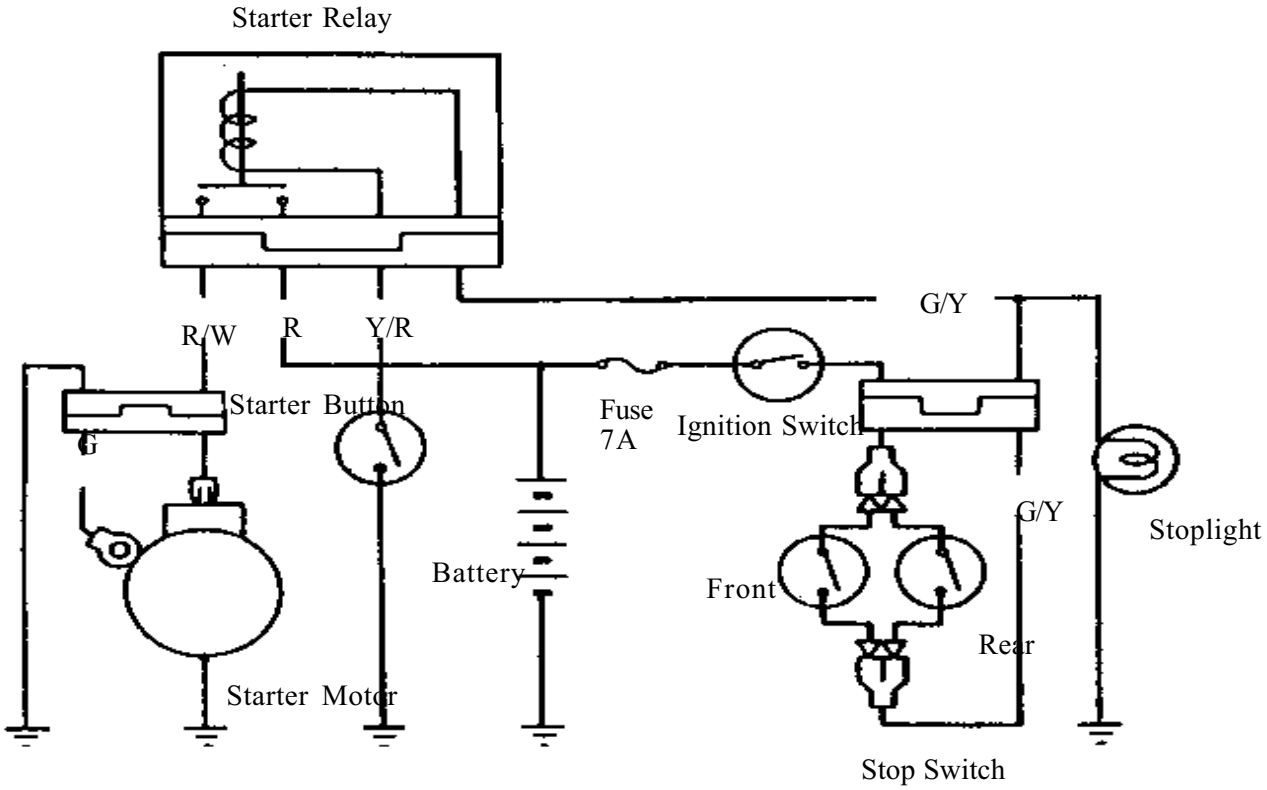
Black

Use the x KΩ range for the Sanwa Tester.
Use the x 100Ω range for the Kowa Tester.

Unit: KΩ

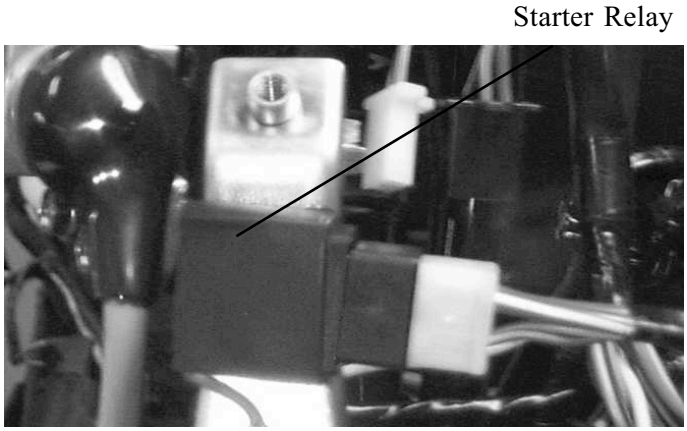
Probe⊕ / (-)Probe	Black	Blue/ Yellow	Green	Black/ Yellow
Black		∞	13~16	∞
Blue/ Yellow	33~40		18~22	∞
Green	8~10	∞		∞
Black/ Yellow	14~17	∞	2.5~3.0	


Ignition Switch
Starter Button
Starter Motor

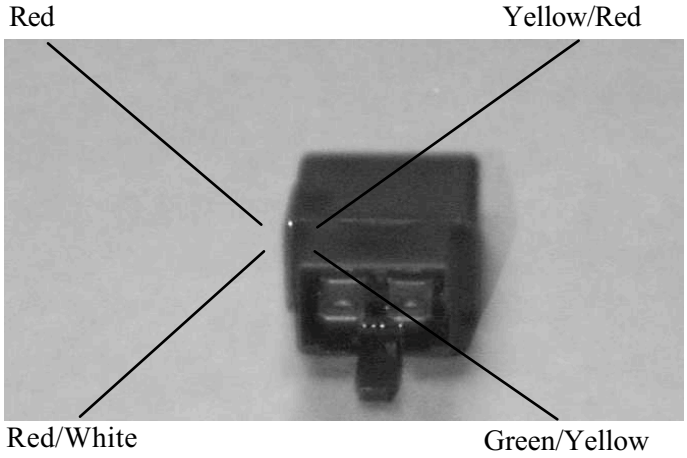

Starter Relay
R/W
R
Y/R
G/Y
Starter Button
G
Fuse
7A
Ignition Switch
Battery
Front
Rear
G/Y
Stoplight
Starter Motor
Stop Switch

STARTER RELAY INSPECTION

Remove the front cover.
Disconnect the starter relay coupler and then remove the starter relay.

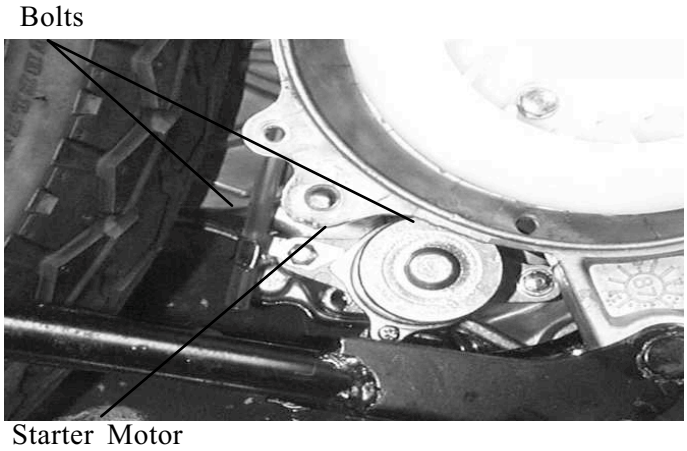


Connect the starter relay green/yellow terminal to the 12V battery positive (+) terminal and the relay yellow/red terminal to the battery negative (-) terminal. Check for continuity between the starter relay red and red/white terminals. The relay is normal if there is continuity.



STARTER MOTOR REMOVAL

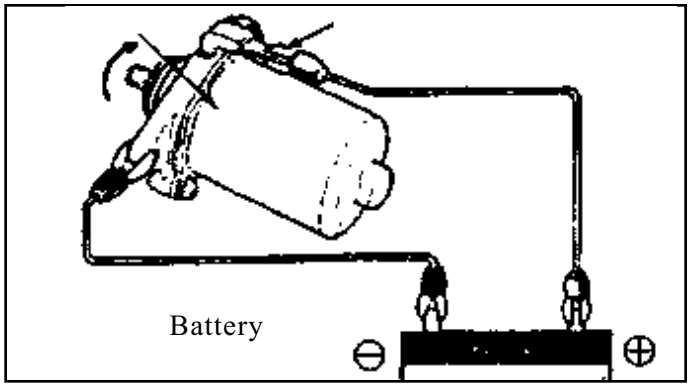
Disconnect the starter motor cable.
Remove the two bolts attaching the starter motor and remove the starter motor.
The installation sequence is the reverse of removal.



STARTER MOTOR INSPECTION

Connect a battery across the starter motor and check for its operation.

✱
1. Do not turn the starter motor for a long time.
2. This inspection should be done with a fully charged battery.



16

INSTRUMENT/SWITCHES/LIGHTS

SERVICE INFORMATION 16-1
TROUBLESHOOTING 16-1
FUEL UNIT 16-2
OIL METER 16-3
SWITCHES 16-5
STOP SWITCH INSPECTION/HORN 16-6
BULB REPLACEMENT 16-7
INSTRUMENT/HEADLIGHT 16-8

SERVICE INFORMATION

GENERAL INSTRUCTIONS

Wires should be connected to other wires of the same color. Couplers must be connected to other couplers of the same color.
All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
After installation of each switch, a continuity check must be performed.

TROUBLESHOOTING

Lights do not come on when ignition switch is "ON"

Burned bulb
Faulty switch
Broken or shorted wire
Fuse burned out
Weak battery
Poorly connected wire
Faulty winker

Light dims

Faulty ignition coil
Wire or switch resistance too high
Faulty regulator/rectifier

Headlight does not change when dimmer switch is turn to Hi or Lo

Faulty or burned bulb
Faulty dimmer switch

Motor oil indicator light does not come on (when motor oil is insufficient)

Fuse burned out
Dead battery
Faulty ignition switch
Faulty instrument
Faulty oil meter

Motor oil indicator light winks

Loose wire connection
Broken wire
Faulty oil meter

Fuel gauge pointer does not register correctly

Disconnected wire or connector
Broken wire
Faulty float
Faulty fuel unit
Faulty instrument

Fuel gauge pointer fluctuates or swings

Loose wire connection
Faulty fuel unit
Faulty instrument

FUEL UNIT

✱ **No Smoking!**

REMOVAL

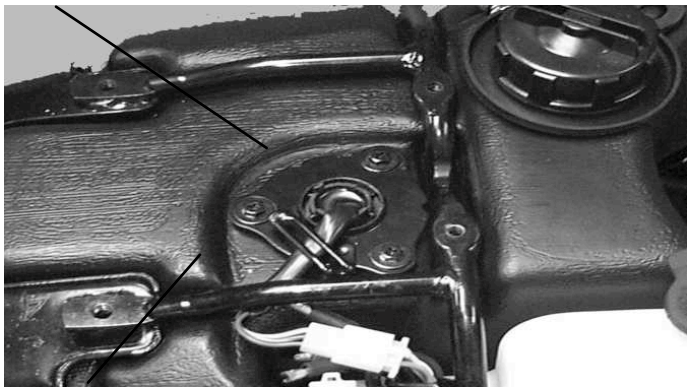
Remove the frame body cover. (⇨12-5)
Disconnect the fuel unit wire connectors.
Remove the three bolts attaching from the fuel unit retainer .

✱ Do not damage the fuel unit wire.

Remove the fuel unit.

✱ Be careful not to bend or damage the fuel unit float arm.

Fuel Unit



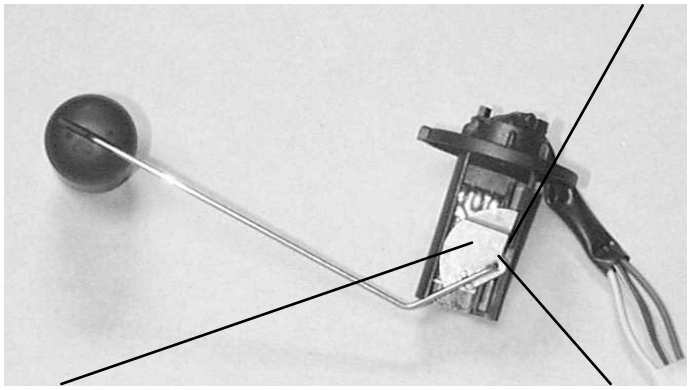
Fuel Unit Wire

INSPECTION

Remove the fuel unit.
Measure the resistance between the fuel unit wire terminals with the float at upper and lower positions.

Wire Terminals	Upper	Lower
G_ Y/W	36Ω	700Ω
G_ L/W	550Ω	160Ω
Y/W_ L/W	600Ω	600Ω

G



Y/W

L/W

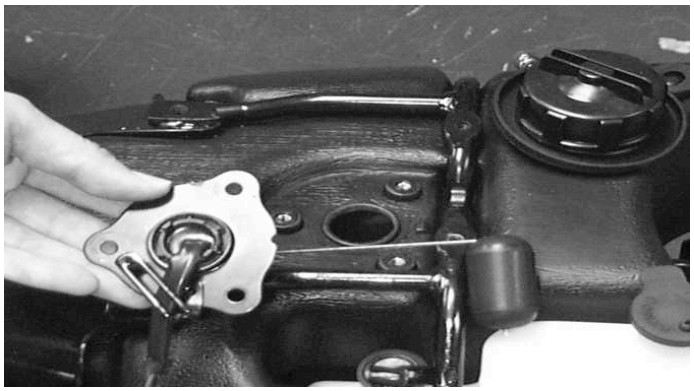
FUEL GAUGE INSPECTION

Connect the fuel unit wire connectors and turn the ignition switch “ON”.

✱ Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

Check the fuel gauge needle for correct indication by moving the fuel unit float up and down.

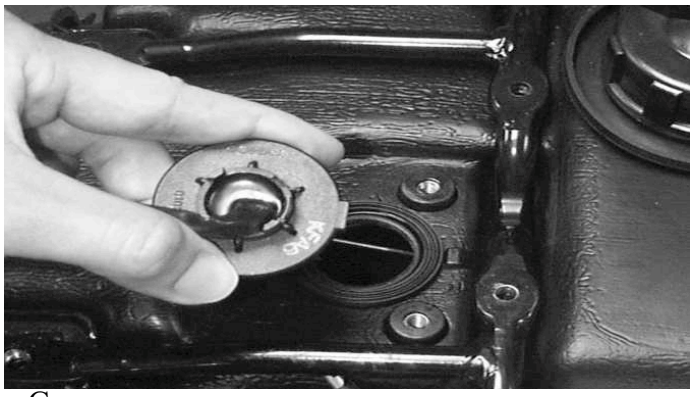
Float Position	Needle Position
Upper	“F” (Full)
Lower	“E” (Empty)



INSTALLATION

The installation sequence is the reverse of removal.

✱ Align the groove on the fuel unit with the flange on the fuel tank.

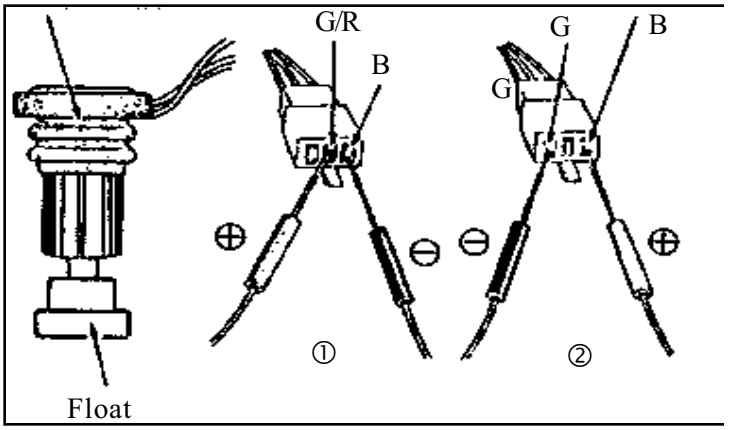


OIL METER

INSPECTION

Remove the met-in box. (⇨12-4)
Remove the frame body cover. (⇨12-4)
Disconnect the oil meter wire connectors and remove the oil meter. Keep the oil meter float at the lower position.
Measure the resistances between the wire terminals as ① and ② shown in the left figure.

Oil Meter



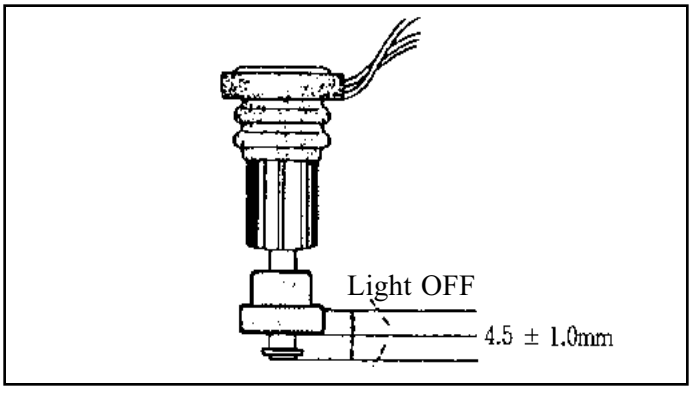
Wire Terminals	Resistance
Green/Red(+)_ Black(-)	46Ω
Green(-)_ Black(+)	∞

✱ Before removing the oil meter, be sure to drain the motor oil and do not allow sparks or flames near the working area.

Oil Meter Operation Inspection

Connect the oil meter wire connectors and turn the ignition switch ON.
Measure the resistance between the wire terminals with the float at upper position.

Green/Red(+)_ Black(-)	About 300Ω

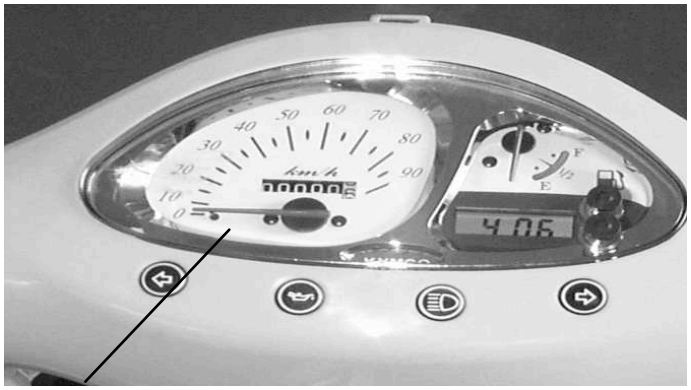


Light ON

✱ Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

Move the oil meter float up and down to see if the oil indicator light will go out and come on.

* If the oil indicator light does not light, check for burned bulb, loose wire or connector. After correction, check again according to the method mentioned above.



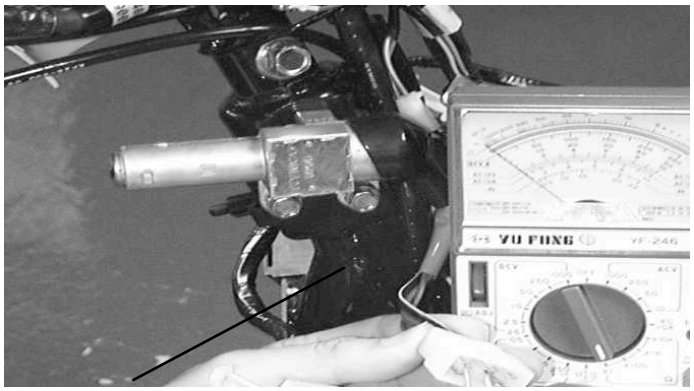
Oil Indicator Light

SWITCHES

IGNITION SWITCH INSPECTION

Remove the front cover. (⇨12-3)
Disconnect the ignition switch wire couplers and check for continuity between the wire terminals.

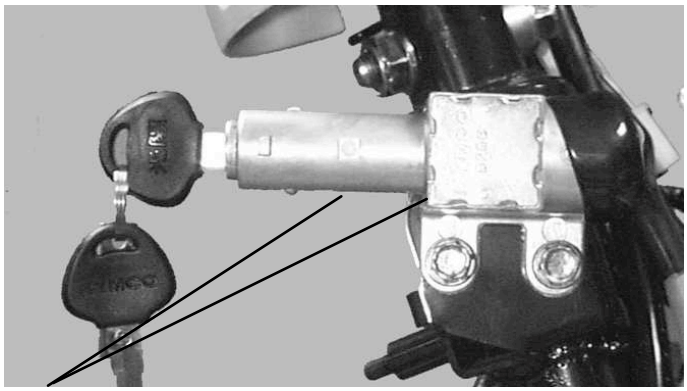
Color	Red	Black/White	Green	Black
Symbol	BAT_1	IG	E	BAT_2
LOCK		O——O		
OFF		O——O		
ON	O——	——	——	——O



Ignition Switch Coupler

IGNITION SWITCH REPLACEMENT

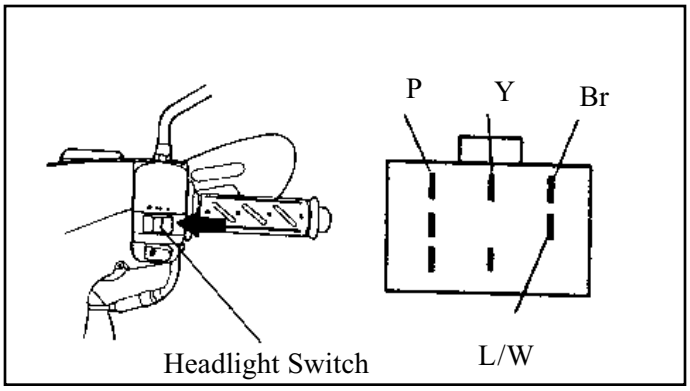
Remove the front cover. (⇨12-3)
Disconnect the ignition switch wire couplers.
Remove the two mounting bolts and remove the ignition switch.
The installation sequence is the reverse of removal.


Bolts

HEADLIGHT SWITCH INSPECTION

Remove the handlebar front cover. (⇨12-3)
Disconnect the headlight switch wire coupler and check for continuity between wire terminals.

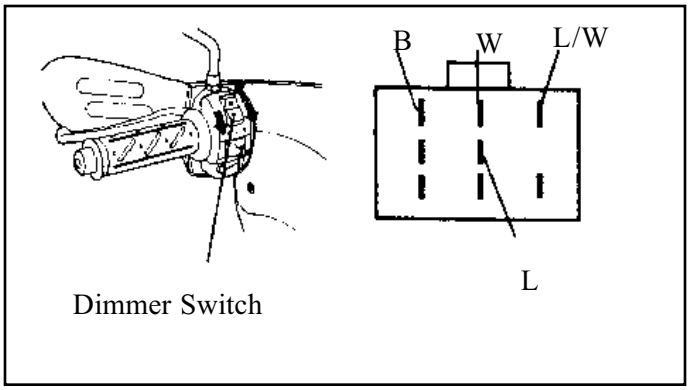
Color	Blue/White	Yellow	Brown	Pink
Symbol	HL	CI	TL	RE
OFF		O		O
P		O	O	
H	O	O	O	



DIMMER SWITCH INSPECTION

Check for continuity between wire terminals.

Color	Blue/White	Blue	White	Black
Symbol	HL	HI	LO	BAT
HI	O	O		
LO	O		O	
PASSING		O		O

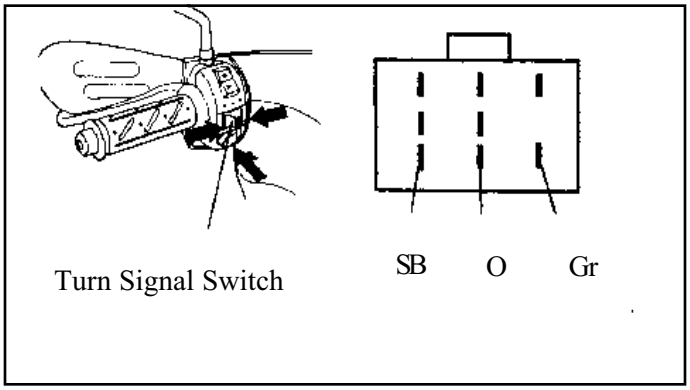


淺

TURN SIGNAL SWITCH INSPECTION

Check for continuity between the wire terminals.

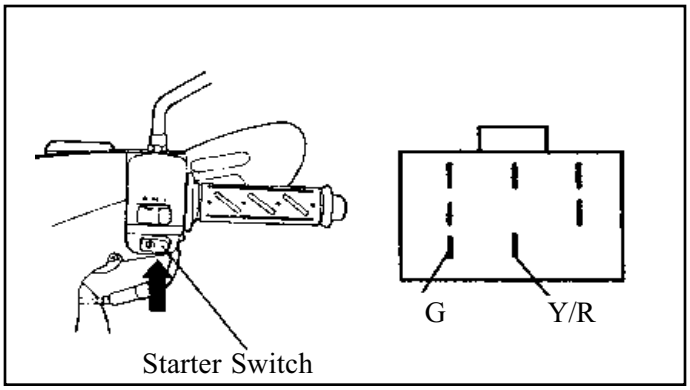
Color	Light Blue	Orange	Gray
Symbol	R	L	WR
R	O		O
L		O	O



STARTER SWITCH INSPECTION

Check for continuity between wire terminals.
Push the starter button when measuring.

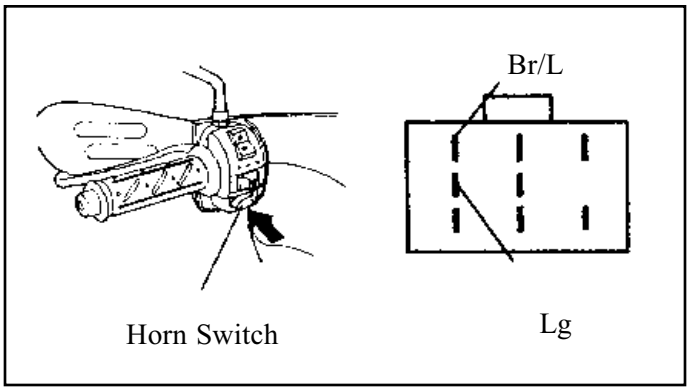
Color	Yellow/Red	Green
Symbol	ST	E
FREE		
PUSH	O———	———O



HORN SWITCH INSPECTION

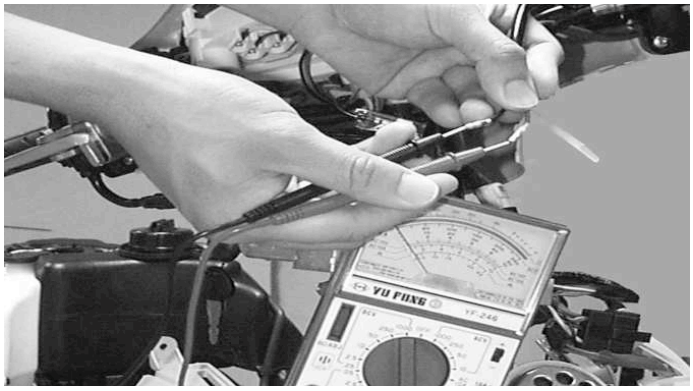
Check for continuity between wire terminals.
Push the horn button when measuring.

Color	Light Green	Brown / Blue
Symbol	HO	BAT
FREE		
PUSH	O———	———O



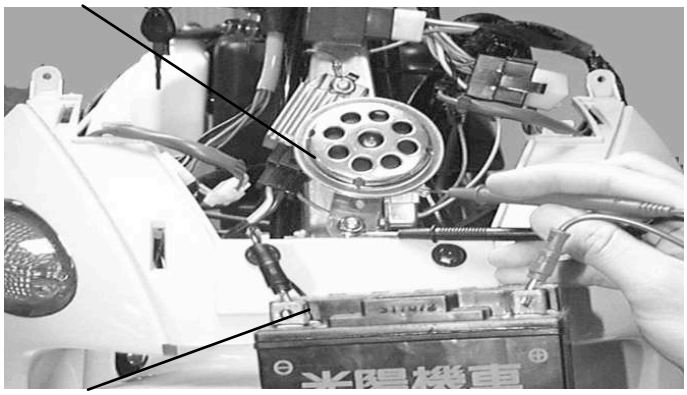
STOP SWITCH INSPECTION

Remove the handlebar front cover. (⇨12-3)
Disconnect the front and rear stop switch wire couplers.
Check for continuity between the wire terminals when the front/rear brake lever is applied.



HORN INSPECTION

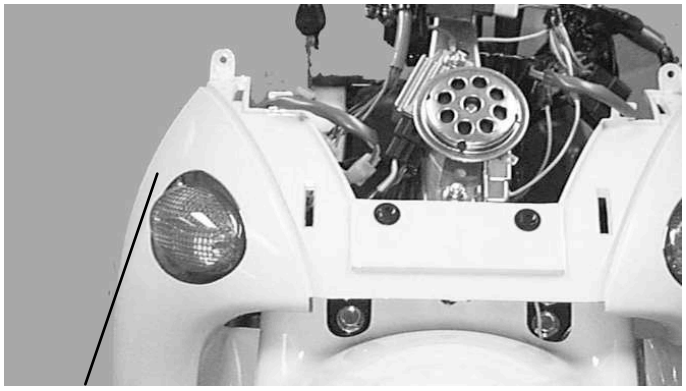
Remove the frame front cover. (⇨12-3)
Disconnect the horn wire couplers. The horn is normal if it sounds when a 12V battery is connected across the horn wire terminals.



FRONT TURN SIGNAL LIGHT REPLACEMENT

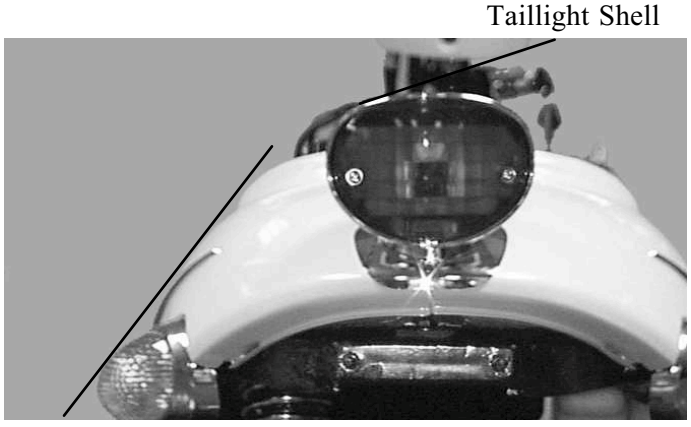
Remove the met-in box. (⇨12-5)
Remove the floor board. (⇨12-4)
Remove the front tool box. (⇨12-4)
Remove two screws attaching the turn signal light shell and the bulb.
Replace with new ones.

✱ Replace with new bulbs of the same specifications.



TAILLIGHT/STOPLIGHT/REAR TURN SIGNAL LIGHT BULB REPLACEMENT

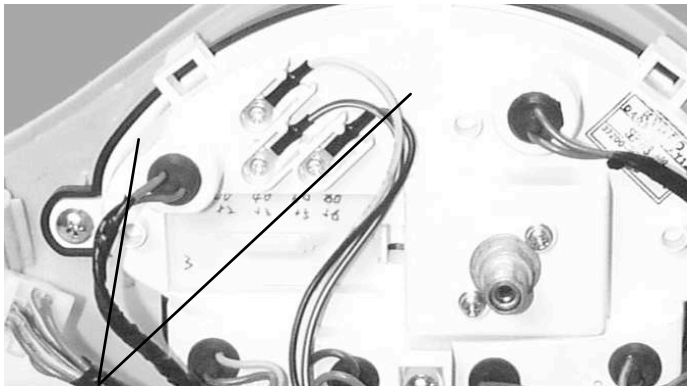
Taillight Shell Removal:
Remove two screws attaching the taillight shell.
Remove the taillight shell and stop light bulb.
Remove screws attaching the rear turn signal light.
Remove the rear turn signal light bulbs.
The installation sequence is the reverse of removal.



INSTRUMENT

Instrument Bulbs Replacement

Remove the handlebar rear cover. (⇨12-3)
Remove the bulbs and replace with new ones.

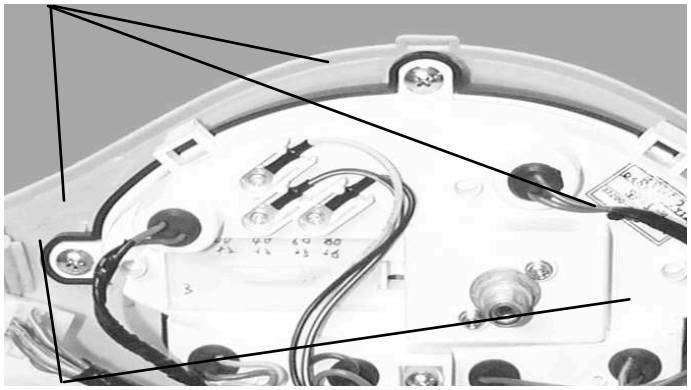


Bulb Sockets

SPEEDOMETER REMOVAL

Disconnect the speedometer cable.
Disconnect the speedometer wire connector.
Remove the three screws attaching the speedometer.
Remove the speedometer.
The installation sequence is the reverse of removal.

Screws



Wire Couplers

HEADLIGHT

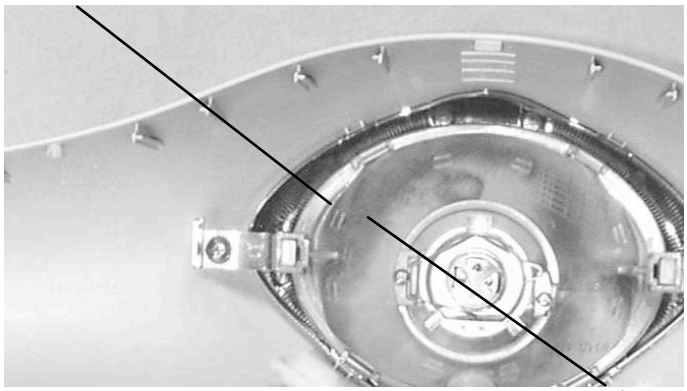
REMOVAL/BULB REPLACEMENT

Remove the handlebar front cover. (⇨12-3)
Remove the bulb sockets and bulbs.

✱ The model adopts krypton gas bulb. When installing, do not directly touch the bulb glass with fingers.
Use bulbs of the same specifications for replacement.

The installation sequence is the reverse of removal.

Bulb Sockets



Coupler